Land West of Bines Road
Partridge Green, West Sussex

Flood Risk Assessment and Drainage Strategy

For

Croudace Homes Ltd

motion

Document Control Sheet

Land West of Bines Road

Partridge Green, West Sussex

Croudace Homes Ltd

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
6th November 2025	Final D	Phil Allen BSc (Hons) MCIWEM C.WEM	Neil Jaques

ISO 9001 Certified
ISO 14001 Certified

Motion
84 North Street
Guildford
GU1 4AU
T 01483 531300
F 01483 531333
E info@motion.co.uk
W www.motion.co.uk

Contents

Appendices

1.0 Introduction

1.1 This Flood Risk Assessment (FRA) and Drainage Strategy has been produced by Motion on behalf of their client, Croudace Homes Ltd. It supports the full planning application for the erection of 101no. residential dwellings, ancillary structures, a new access road, internal roads, car parking, landscaping and public open space, drainage features, a cycle link and associated works on the land west of Bines Road, Partridge Green, West Sussex.

1.2 A site location plan and red line boundary of the proposed development can be seen in Appendix A and the proposed development layout can be seen in Appendix B.

1.3 The Environment Agency's (EA's) Flood Map for Planning shows that the site is within Flood Zone 1 (Low Risk). However, because the proposed development is greater than one hectare in size an FRA is required to be in accordance with the NPPF.

1.4 The proposed development is 'major' in planning terms and has the potential to generate additional surface water runoff over the greenfield site, so a drainage strategy is also required to demonstrate how the development will manage and discharge surface water generated in all rainfall events up to and including the 1 in 100-year + 45% storm. Exceedance events will also need to be considered, along with how the development's hard surfaces may change over time and how drainage infrastructure should be managed and maintained going forward.

1.5 Therefore, this FRA and drainage strategy has been produced to discuss the flood risks to the proposed development, from all sources. This FRA and drainage strategy will also define how the development will manage its surface water and foul sewage so that the development does not increase flood risk in the area or to neighbouring properties/land over the existing situation.

1.6 This FRA and drainage strategy follows the guidance set out in:

- West Sussex LLFA Policy for the Management of Surface Water (November 2018)
- National Planning Policy Framework (NPPF)
- Planning Practice Guidance (PPG) to the National Planning Policy Framework
- CIRIA SuDS Manual 2015 (C753)
- Environment Agency Rainfall Runoff Management for Developments
- The New National Standards for SuDS (July 2025)

1.7 This application follows the recent identical application on the site (planning reference DC/24/1699), within which West Sussex County Council (WSCC) as the Lead Local Flood Authority (LLFA) initially objected to the scheme and the drainage strategy. Following dialogue with WSCC and the provision of further details on the drainage strategy, this objection was subsequently removed, and the application was recommended for conditional consent on drainage matters. This will be discussed later in this report.

1.8 This FRA and drainage strategy report pertains only to the drainage strategy for the development. It does not provide details of how the site will be drained during the construction phase. This report is also not a drainage verification report, which can only be produced post-construction.

1.9 Similarly, this report does not provide information on how the drainage infrastructure will be protected during the construction phase of the project. The provision of this information is the responsibility of the appointed contractor.

2.0 Site Description

Table 2.1: Site Summary

Site Name	Land west of Bines Road
Location	Partridge Green, West Sussex
Grid Reference (6 Figure)	TQ 188 187
Site Area	6.3 ha
Application Type	Full planning application for a residential development of 101 units
Flood Zone	1 (low risk)
Surface Water Flood Risk	Yes
Local Water Authority	Southern Water
Local Planning Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council

Site Location and Description

2.1 The proposed development site covers a 6.3 ha plot of greenfield land that lies to the west of Bines Road and to the south of Lock Lane in Partridge Green, West Sussex. Partridge Green is between the towns of Horsham and Steyning to and lies approximately 3.5 km to the west of the A24 dual carriageway.

2.2 The site is an irregularly shaped plot of agricultural farmland used for arable land/crops. The site is bounded by a hedgerow and the private road of Lock Lane to the north. Another hedgerow and the property of 'Crouchers' lies the east, beyond which is Bines Road and the industrial/commercial units of the 'Star' industrial estate. The southern boundary of the site is bordered by further hedgerows and to the west of the development site is farmland associated with the same landholding as the development site.

2.3 Within the site are two lines of sporadically placed mature trees (running north-south).

2.4 Ditches exist on the northern and southern boundaries of the site (as discussed, below).

Topography

2.5 A topographic survey of the site was carried out by Encompass Surveys in September 2021. This can be seen in Appendix C of this report.

2.6 The survey shows that the highest topographic levels are in the southeast of the site, where ground levels are in the region of 10.2 metres Above Ordnance Datum (mAOD).

2.7 The general fall of the land is to the west/northwest, with the lowest elevations on site being in the north-western corner of the site where ground levels fall to between 6.5 mAOD and 7.0 mAOD.

2.8 The site has a slight central ridge that runs east-west and creates two hydraulic catchments. To illustrate this, a contour plan using LiDAR data has been produced and this can be seen in Appendix D. This contour plan shows that the southern and south-western corner of the site drain to the southern boundary, whereas the central, northern and north-western parts of the site drain to the northern boundary. Both the southern and northern boundaries are marked by drainage ditches, which are more pronounced towards the western extent of the site.

2.9 Overall, changes in topography are shallow and the site is characterised by gentle gradients.

Geology

2.10 The BGS Geoindex 1:50,000 scale mapping shows that the site's bedrock geology is Weald Clay Formation - Sandstone. No superficial deposits are recorded. The DEFRA Online MagicMap indicates that the site has soils that are 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.' Therefore, early indications are that the local geology is clay-based and would be prohibitive to infiltration.

2.11 There are no BGS borehole logs located within the vicinity of the site so no site-specific information is available that shows the depth of geological strata below the site and no estimation of general groundwater levels can be made.

Hydrogeology and Groundwater

2.12 As above, no information on groundwater is available, but Defra's Magic Map shows that neither the solid nor the superficial geology are designated as aquifers. Noting the clay geology, it expected that the soils will be hydraulically unproductive and with little or no groundwater movement.

2.13 Notwithstanding this, the site's proximity to Groundwater Source Protection Zones (SPZ's) was checked. SPZ's are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.

2.14 SPZ's show the risk of contamination to groundwater from any activities that might cause pollution in the area. The closer the activity to the source of abstraction, the greater the risk. The maps show three main zones; inner – Zone 1; outer – Zone 2 and; total catchment – Zone 3.

2.15 Defra's Magic Map was reviewed, and the site is not within in any SPZ's. This concludes that the site will have little influence on groundwater and vice versa.

Infiltration Potential

2.16 Experience of the geology described above confirms that infiltration is highly unlikely to be viable in the clay. Noting the clay-based soils and Weald Clay solid geology, this would preclude infiltration-based surface level SuDS and deeper infiltration structures on the site.

2.17 It is noted that the LLFA desire to see BRE Digest 365-compatible soakage tests for all sites so that they can be used as evidence for the specification for or against infiltration as a means of surface water discharge. The proposed development has not carried out soakage testing due to the confidence that they will not be successful in the clay soils, and the drainage for the site will not use infiltration. On this basis, Motion request that a pre-commencement condition is recommended by the LLFA requesting BRE365 soakage testing, which our client would accept.

Hydrology

2.18 The nearest designated main river is the River Adur, which runs north to south approximately 690m to the west of the site boundary.

2.19 The ditches on the southern and northern site boundaries mentioned above are shown to develop to the west of the site (so that they are visible as watercourses on Google and OS Mapping) and they are tributaries of the River Adur. This means that the ditches, which can be considered as 'Ordinary Watercourses' have ongoing connectivity into the wider hydraulic network.

2.20 At the western extent of the site, the depth of the ditches (and their inverts) can be seen in the topographic survey (Plots 3 and 4) in Appendix C. The northern ditch has inverts of circa 5.80 mAOD and the southern ditch has an invert indicated to be between 6.86 mAOD and 6.95 mAOD.

2.21 The presence of numerous surface water features on the site's boundaries and beyond is also testament to the lack of permeability in the local soils and the unlikely success of infiltration as a means of surface water disposal.

Existing Drainage Regime

2.22 The site is greenfield and currently undeveloped. Therefore, the site has no formal drainage, and the existing drainage regime is natural overland flow following the gradients/catchments discussed above to the ditches/ordinary watercourses on the site boundaries.

2.23 An asset location plan was obtained from Southern Water, and this can be seen in Appendix E. This shows that there no public surface water sewers within the site or in the immediate vicinity of the site boundary. There is, however, a public foul sewer in Bines Road that runs north-south via a 150mm dia. pipe at a depth of circa 1.4m below ground level (BGL) where the site access is proposed.

The Proposed Development

2.24 The development proposes 101 residential units with the following housing mix as in Table 2.2.

Table 2.2: Housing Mix

Unit Type	Number of Units
1-bed flat	8
2-bed house	29
3-bed house	43
4-bed house	19
5-bed house	2
TOTAL:	101

3.0 Flood Risk Legislative and Policy Framework

3.1 LLFA's including WSCC have a responsibility under the FWMA to develop, maintain, apply and monitor the application of a strategy for local flood risk in their area. Local flood risk is defined as flood risk arising from local sources, such as surface water run-off, groundwater and ordinary watercourses (i.e. non main rivers). The EA plays a role in managing the watercourses designated as 'main rivers'.

3.2 West Sussex often delegates their LLFA responsibilities to Local Planning Authorities. It is often the case that MSDC consult on local flood risk and drainage matters, and we expect that this will be the case for the current application.

The National Planning Policy Framework

3.3 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The Planning Practice Guidance (PPG) to the NPPF provides further information on the policies set out in the NPPF. It encourages development to take place in areas of lower flood risk wherever possible and stresses the importance of preventing increases in flood risk off-site to the wider catchment area. This includes ensuring that flood risk is considered at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are highest.

3.4 The process of directing development away from those areas where risks are highest is the Sequential Test. It covers all forms of flooding, and this is covered in Paragraphs 23 and 24 of the NPPF. Following the December 2024 update to the NPPF, Paragraph 175 was added that states that development can be appropriate on sites with flood risk "*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 not be at risk of flooding from any source, now and in the future*". This essentially means that if a sequential approach is applied within the site boundary, and areas of flood risk now and in the future are avoided, that flood risk should not prevent the development coming forward and that the Sequential Test is not required.

The Environment Agency Flood Map for Planning

3.5 The updated Environment Agency's Flood Map for Planning was released on 25th March 2025. This updated and new National Flood Risk Assessment (NaFRA) uses both existing detailed local information and improved national data, includes the potential impact of climate change on flood risk, based on UK Climate Projections (UKCP18) and shows potential flood depths. This allows the Flood Map for Planning to provide much higher resolution maps that make it easier to see where there is risk

3.6 The New NaFRA Flood Map for Planning remains split into 'Flood Zones', which demarcate the extent of flooding from rivers or the sea for different return periods.

3.7 Table 3.1, on the next page, lists the flood zone categories and explains the flood risk probabilities they represent.

Table 3.1 – Flood Zone Categories

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of tidal flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of tidal flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water must flow or be stored in times of flood, which is typically the 1 in 30-year flood event or greater. Local planning authorities should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map, but may be distinguished in Product 4 information, for example)

3.8 A site-specific FRA is required for proposals of 1ha or greater in Flood Zone 1, all proposals for development in Flood Zones 2 and 3, or in an area within Flood Zone 1 that has critical drainage problems (as notified to the local planning authority by the EA). There are areas of surface water flood risk on the boundaries of the site and the site is over 1ha in area, thus flood risk from all sources will be reviewed for the completeness of the application.

3.9 An FRA should identify and assess the risks of all forms of flooding and demonstrate how these flood risks will be managed so that a development remains safe throughout its lifetime, taking climate change into account.

3.10 Within each Flood Zone, a key factor in determining planning applications for development is the flood risk vulnerability of a development. Table 2 of the PPG to the NPPF categorises different development types according to their vulnerability to flooding. These categories are:

- Essential infrastructure;
- Highly vulnerable development;
- More vulnerable development;
- Less vulnerable development, and;
- Water-compatible development.

3.11 Within the different Flood Zones each of the above development categories are considered appropriate or not permissible. The Technical Guidance to the NPPF lists these as:

Flood Zone 1:

- All the development categories listed above are appropriate.

Flood Zone 2:

- Water-compatible, less vulnerable development, more vulnerable development and essential infrastructure is appropriate in this zone.

Flood Zone 3a:

- Water-compatible and less vulnerable development is appropriate in this zone. Highly vulnerable development should not be permitted in this zone.

Flood Zone 3b:

- Only water-compatible development and essential infrastructure that must be there should be permitted in this zone.

3.12 The above information sets out the basis by which developments must be assessed in terms of flood risk.

3.13 The development will be reviewed against the Flood Zone in which it is located, and an assessment will be made of the appropriateness of the proposed development, as per the advice within the PPG to the NPPF, taking account of the proposed site layout for the development shown in Appendix A.

The New National Standards for SuDS

3.1 On 19 June 2025 the UK government published its new National Standards for Sustainable Drainage Systems (SuDS). The new standards are a minor evolution of industry standards and current best practice, many of which practitioners and design engineers had already been actively incorporating in recent years. Therefore, while the New National Standards do not fundamentally change current standards, they are a welcome step in clarifying points that had previously been uncertain and has enshrined them in a single piece of guidance.

3.2 The standards emphasise and how sustainable drainage and flood risk should be considered in developments, and the importance of site appraisal and early, integrated design with the site's natural features and proposed infrastructure.

3.3 The New National Standards for SuDS outline that;

- SuDS a mandatory for major developments and drainage strategies must conform with the new national criteria and LLFA guidance.
- There is a stronger emphasis on the 'four pillars' of SuDS. Drainage strategies must demonstrate benefits for water quantity and quality as well as amenity, and biodiversity. This pushes designers to incorporate more surface level SuDS and rely less on below-ground attenuation.
- There is more clarity on long-term adoption & maintenance of SuDS system and LPA's will expect clearer maintenance and management strategies for drainage systems and require stronger evidence of deliverability.

3.4 As stated before, this is a minor evolution of the current approach to drainage design, but there are subtle differences in the design factors, which could lead to an increase in size of attenuation features. In addition to the above overarching principles of the New National Standards for SuDS, the below specific points should be borne in mind by designers and included in any drainage strategies:

- Standard 2 provides explicit guidance on the management of everyday rainfall. The first 5mm of rainfall (the 'first flush') must be managed by interception and should not leave the site. Instead, it should either collected for reuse, infiltrated into the ground, or else captured, conveyed, and stored within SuDS features (but there are specific criteria that make this last point acceptable).
- The latest standards now formalise that the minimum permissible infiltration rate for discharging surface water via a 'System A' (Total Infiltration) solution. The minimum infiltration coefficient that can support an infiltration-based drainage solution is 1.0 x 10^{-6} m/sec. Additionally, the standards now add that the half drain in the 3.3% AEP event should be less than 24 hours.
- A 'relaxation factor' should instead be applied to the target greenfield runoff rates on brownfield site. It defines that the maximum relaxation factor for runoff rates should be no greater than five times the greenfield rates. This allows for easier implementation on heavily developed urban sites, especially where LLFA's previously demanded greenfield runoff rates.

- The New National Standards confirm a previous 'grey area' by stating that SuDS features should be included in the contributing catchment area. It also notes that there is no requirement to provide attenuation for external overland flows entering the site, but these flows should be considered for capacity of the pipe network.
- Standard 3 of the New National Standards for SuDS clarifies the expectations with regards to urban creep. It says "*within developments an urban creep uplift factor shall be applied by adding a percentage increase to the calculated area of the impermeable area within the property curtilages. This shall be 10% for all developments unless there are no external private permeable spaces, for example, flats and apartments, when it shall be 0%*."

3.5 The proposed development on the Land West of Bines Road acknowledges the requirements of the New National Standards for SuDS and will deliver them through the drainage strategy.

4.0 Current Flood Risk

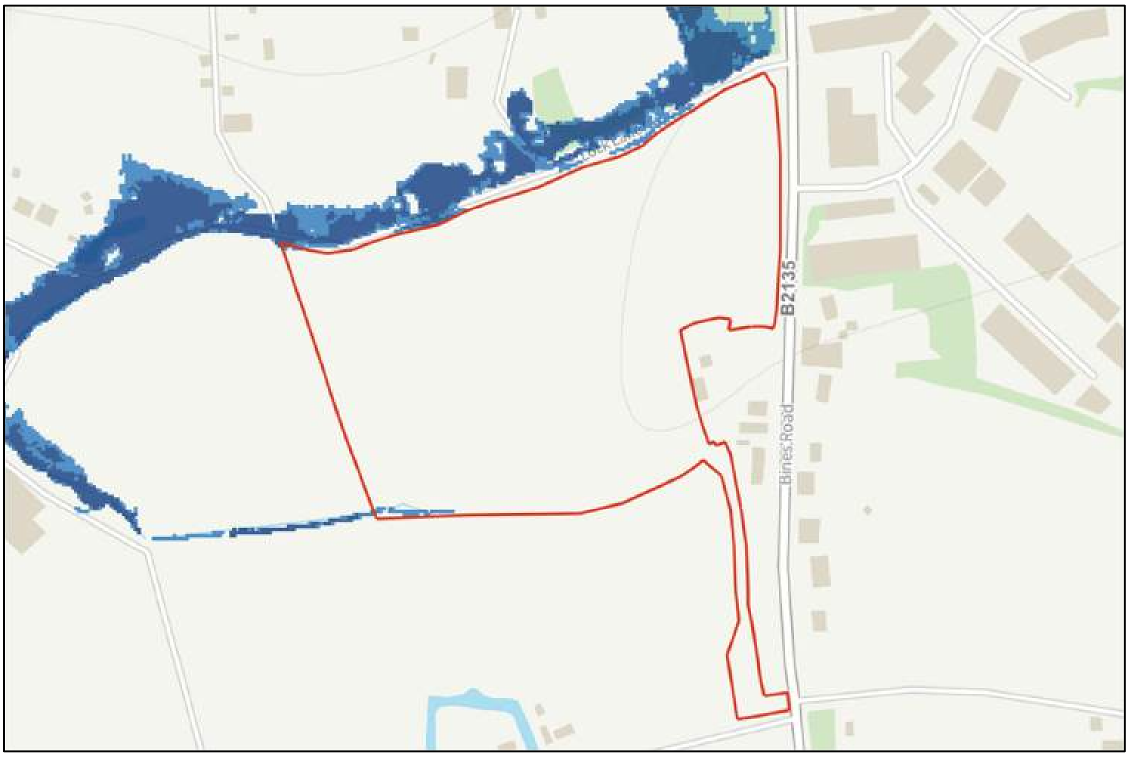
4.1 Flooding can arise from a variety or combination of sources. These may be natural or artificial and may be affected by climate change. These are discussed, below, in the following two sections and summarised in Table 6.1. The probability of any likely impacts is also assessed, where necessary.

Flooding from Rivers and the Sea

4.2 The 2025 EA Flood Map for Planning can be seen in Appendix F of this report, and an excerpt of this map is in Figure 4.1, below. It shows that the development is not at risk of flooding from rivers. All flood risk areas are outside of the red line boundary for the site. The flood risk on Lock Lane is associated with the ditches and ordinary watercourses to the north of the site, but none of these flood risk areas ingress into the site.

4.3 There is a small linear area of fluvial flood risk within the site's southern boundary. This area is very minor and not within an area of any built infrastructure (it follows the ditch that is within the site). As such, and in accordance with Para. 175 of the NPPF, this is of no consequence to the built development (and vice versa) and the Sequential Test does not need to be carried out. All residential development and built development is within Flood Zone 1.

Figure 4.1 – Fluvial Flood Risk and the Development Site



4.4 Table 3 of the PPG to the NPPF shows that residential development, which is considered to be 'more vulnerable', is appropriate within Flood Zone 1 and confirms that the Sequential Test and Exception Tests do not need to be completed.

Table 3 of the NPPF - Flood Risk Vulnerability and Flood Zone Compatibility

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

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Surface Water Risk

4.5 The EA's 2025 NaFRA2 Risk of Flooding from Surface Water (RoFSW) dataset for the site can be seen in the plans in Appendix G. Both the present day and climate change scenarios are shown, and it appears that there is little difference between the two datasets.

4.6 It shows that up to and including the 1 in 1,000-year flood event that no part of the site interior or developable area is at risk of surface water flooding, which includes all locations where dwellings, accesses, parking and above-ground structures are proposed.

4.7 The mapping shows that surface water flood risk is primarily focused on the areas of the existing ditches and watercourses, and reflects the pattern of fluvial flooding seen in the EA Flood Map for Planning.

4.8 There is some surface water flood risk shown in the north-eastern corner of the site in an area designated for landscaping and greenspace. The same is true of an area of surface water flood risk shown on the south-eastern corner of the main body of the site, adjacent to Savernake Cottages.

4.9 There are two areas of surface water flood risk – on the northern boundary and in the south-eastern corner of the site – that at first glance could be seen to conflict with infrastructure elements, namely the swale on the northern boundary and the SuDS basin in the south-eastern corner. Because of this, it should be noted that these areas of surface water flood risk originate on site, and in the case of the area of risk on the northern boundary, are completely isolated. These areas of surface water flood risk would therefore be picked up by the drainage strategy and would not exist on the built site, which would capture all surface water and convey to the areas of attenuation.

4.10 With that in mind, the built site would not exhibit any uncontrolled areas of surface water flood risk, which would be fully mitigated by the design of the site and its drainage strategy.

4.11 This accords with the requirements of the September 2025 update to the NPPF and Paragraph 27, which now states "*in applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment*

Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied".

4.12 Surface water would not be increased elsewhere and would be of no impact to the site, it's drainage strategy, or any other infrastructure. As such, the development is appropriate in this location, is in accordance with the current NPPF, and the sequential test does not apply.

Groundwater Susceptibility

4.13 There are no flood risk maps for groundwater, as stated by the Environment Agency in their 2011 guidance note 'flooding from groundwater'. Mapping products currently available only show areas where the geological and hydrogeological conditions *may* combine to cause groundwater flooding, but they should not be considered as groundwater flood risk maps. They only show *susceptibility* to groundwater flooding.

4.14 There are several mapping products that depict areas that may be susceptible to groundwater flooding, but they are not comparable in detail to the risk maps developed for fluvial, tidal and surface water, such as those scrutinised above and used to support planning decisions. The mapping does not show the likelihood of groundwater flooding occurring and can only be considered as a hazard, but not a risk-based dataset.

4.15 As such, the mapping products can be viewed as indicative at best and should only be used as a prompt to review site-based information to determine whether groundwater is a risk factor that should be considered. Indeed, the Environment Agency state that:

"*The susceptibility data should not be used on its own to make planning decisions at any scale and, in particular, should not be used to inform planning decisions at the site scale. The susceptibility data cannot be used on its own to indicate risk of groundwater flooding*."

4.16 To investigate groundwater flooding susceptibility, this FRA will review groundwater flooding susceptibility mapping, which can be seen in Appendix H. There are three different forms of groundwater susceptibility mapping, which are discussed in turn, below.

BGS Geological Indicators of Flooding

4.17 The BGS Geological Indicators of Flooding map shows that the site is not within an area where there are geological indicators of flooding.

BGS Groundwater Flooding Susceptibility

4.18 The BGS Groundwater Flooding Susceptibility map shows that the site is in not an area where there is potential for groundwater flooding to occur.

Geosmart Information Groundwater Flood Map

4.19 The Geosmart Information Groundwater Flood Map is considered to be the most reliable map in terms of susceptibility to groundwater flooding as it brings together multiple factors in its assessment of groundwater flood risk (rather than just geology, or hydraulic productivity).

4.20 The Geosmart Information Groundwater Flood Map places the site in an area of 'negligible' risk.

Groundwater Flooding Susceptibility Summary

4.21 In summary, mapping shows negligible to zero susceptibility to groundwater flooding. This is in line with the hydraulically unproductive characteristics of the local geology, which has been described above in Section 2.0 of this report.

Flooding from Infrastructure Failure

4.22 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse, siltation, blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

4.23 Typically, sewer systems are constructed to accommodate rainstorms with a 30-year return period or less, depending on their age. Consequently, rainstorm events greater than 1 in 30-years would be expected to result in surcharging of some parts of the sewer system. In fact, due to most gullies being poorly maintained and often partially blocked with silt, leaves and other debris, their capacity is often estimated to be closer to the 1 in 10-year storm.

4.24 With regards to the proposed development's drainage system and risk of failure, it will be designed to attenuate the 1 in 100-year + 45% rainfall event and will be designed to adoptable standards in line with the DCG and the requirements of Building Regulations Part H. A drainage management and maintenance plan will also be provided, which will prescribe how the onsite drainage infrastructure should be looked after so that it works at optimum capacity. This will ensure that residual flood risks to the site from its internal drainage systems will be minimised.

Flooding from Artificial sources

4.25 The EA provides a map showing the maximum potential flood extent should all reservoirs with a capacity of greater than 25,000 cubic metres fail and release the water they hold.

4.26 The map shows that proposed development site would not experience flooding in this scenario.

4.27 There are no canals in the local area to create flood risk either.

5.0 Future Flood Risk & Climate Change

5.1 The NPPF and its supporting PPG sets out how flood risk should be considered over the lifetime of a development. This requires an increase in flood risk due to climate change to be taken into account. Both peak river flows and rainfall intensity should be assessed.

Peak River Flows

5.2 The site is within Flood Zone 1 and the ordinary watercourses on the site boundaries are not shown to exhibit any flood risk, thus future fluvial flood risk does not need to be considered any further.

Peak Rainfall Intensity and Climate Change

5.3 Partridge Green is within the Adur and Ouse Management Catchment. The peak rainfall climate change allowances for this catchment are as follows in Table 5.1, below:

Table 5.1: Climate Change Predictions for the Adur and Ouse Management Catchment

1 in 30-year Rainfall Event	Central Allowance	Upper End Allowance
2050's epoch	20%	35%
2070's epoch	20%	40%
1 in 100-year Rainfall Event	**Central Allowance**	**Upper End Allowance**
2050's epoch	20%	45%
2070's epoch	25%	45%

5.4 Appendix G has included the future surface water flood risk mapping, and this does not indicate that the site, the development, or its infrastructure will be at risk of surface water flooding in the future.

6.0 Summary of Residual Flood Risk

6.1 Table 6.1, below, summarises the residual level of flood risk, from all sources, once mitigating factors, site design and climate change has been considered (as laid out in Sections 4 and 5, above).

Table 6.1: Summary of Flood Risk

Flood Source	Risk Level				Comment
	High	Medium	Low	Very Low	
Fluvial				X	There are no watercourses in the vicinity and the site is at very low risk of fluvial flooding
Tidal				X	The site is not at risk of tidal flooding
Groundwater				X	The site is in an area where three forms of groundwater susceptibility mapping have defined that it is at negligible to zero risk of groundwater flooding.
Surface Water			X		There are very small areas 'low' risk of surface water flooding on site. These originate and terminate on site and will be eliminated by the built development's drainage strategy
Canals				X	There are no canals in the vicinity.
Reservoirs				X	There are no reservoirs in the vicinity.
Infrastructure Failure			X		The risk of infrastructure failure will be made negligible through drainage systems designed to accord with Building Regulations and adoptable standards.
Increase due to Climate Change			X		Climate change-related increases in rainfall are not expected to impact the development, especially because the drainage strategy will be designed to capture and attenuate the 1 in 100-year + 45% rainfall event.

7.0 Surface Water Drainage Strategy

Sustainable Drainage Overview

7.1 Current planning policy and EA guidance requires developments to employ SuDS (Sustainable Drainage Systems) techniques wherever feasible.

7.2 The key benefits of SuDS are as follows:

- Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g., roads);
- Improving amenity through the provision of open green space;
- Improving biodiversity through increased areas for wildlife habitat; and
- Enabling a natural drainage regime that recharges groundwater (where possible).

7.3 SuDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used where possible in a management train that mimics the natural pre-developed pattern of drainage.

Site Area and Greenfield Runoff Rate

7.4 The developed site's impermeable areas will be 1.975 ha, which is inclusive of urban creep to acknowledge what the future impermeable areas of the site could be. Urban creep is discussed further in this section of the drainage strategy (please note that this does not match the site's impermeable areas in the MicroDrainage hydraulic model outputs, which also include the area of the SuDS features and shows a total area of 2.167 ha).

7.5 As discussed earlier in this report, the site has two hydraulic catchments. Catchment One, which is the smaller of the two, drains to the south and catchment two, which drains the majority of the site, drains to the north.

7.6 Catchment One is 0.332ha and Catchment Two is 1.643ha.

7.7 With this in mind, the greenfield runoff rate has been determined for both of these catchments and this will guide the developed site's surface water discharge rates.

7.8 The greenfield runoff rates have been calculated using the QMED value, which is the index flood in the Flood Estimation Handbook (FEH). QMED has been calculated for rural and urban values in MicroDrainage using the catchment descriptors methodology, which includes the following input variables:

- Site Location
- SAAR – Standard Average Annual Rainfall 1961 – 1990 (mm)
- SPR Host - Standard percentage runoff derived from HOST soils data
- URBEXT - The extent of urban and suburban cover
- BFIHOST - Baseflow index derived from Hydrology of Soil Types (HOST) soils data
- FARL - Index of flood attenuation due to reservoirs and lakes

7.9 The QMED calculation for both Catchment One and Catchment Two can be seen in Appendix I, but the outputs are summarised in Table 7.1, below.

Table 7.1: QMED Rural/Urban Values for Catchment One and Catchment Two

Catchment	Impermeable Area	QMED Rural Runoff Rate
Catchment One	0.332	5.10 l/s
Catchment Two	1.643	19.80 l/s

7.10 Therefore, the target runoff rates for the developed site will be 5.10 l/s for Catchment One and 19.80 l/s for Catchment Two. This ensures that the development's runoff will never exceed the QMED greenfield runoff rate, even in higher order storms when the undeveloped site's runoff rate would be far in excess of this. This provides protection to the site and the local area in terms of surface water flood risk because the high levels of runoff that would ordinarily occur during flood events will no longer do so.

Drainage Strategy Overview

7.11 The drainage strategy for the proposed development will use a mixture of surface level attenuation features and SuDS. These will provide the requisite surface water storage requirements, as well as pollution mitigation while tying into the landscaping and ecological strategy for the development. This summary should be read in conjunction with the Drainage Strategy plan and sections in Appendix J.

7.12 The shared spaces, which are predominantly the homezones and tertiary streets, will be constructed from System C (tanked) permeable paviours. This will provide source control for rainfall falling on the surrounding properties' roofs and driveways (which will discharge directly into the subbase of the permeable paviours) and on the road surface itself. The 30% porous subbase (nominally 450mm deep) will provide attenuation and pollution mitigation, and the extent of the permeable paviours enables the overall drainage system to remain shallow so that the subsequent invert levels of the open SuDS features and outfalls can be successfully met. The shallow gradients across the site will be nullified by using check-dams/baffles within the subbase of the permeable pavements so that their attenuation volume is maximised. The quantity and distribution of the check-dams will be confirmed at the detailed design stage.

7.13 As well as the permeable paviours, a system of open SuDS features will be used, which will also offer amenity and biodiversity opportunities and ensures that the proposed drainage strategy provides all four SuDS pillars (water quality and quantity improvements, as well as amenity and biodiversity).

7.14 Catchment One will include a SuDS basin prior to the final outfall for this catchment in the southwest corner of the site. Catchment Two will include a swale on the northern boundary and large SuDS basin in the northwest corner of the site prior to the final outfall for this catchment.

7.15 There will, therefore, be two surface water discharges from the site to the ditches/ordinary watercourses on the southern and northern boundaries of the site. As has been established in this report, these ordinary watercourses have ongoing connectivity (which can be seen on Google and OS Mapping) and are tributaries of the River Adur. The surface water discharges to the ordinary watercourses will be at no more than the QMED greenfield runoff rate, for all storms, for each catchment. The flow from the final outfalls will be controlled by hydrobrakes and a system of orifice plates will be employed across the site so that attenuation volume in the other SuDS features and permeable paviours is maximised. This also provides the drainage strategy with resilience so that surface water is attenuated across the site and does not rely on a single 'end of pipe' solution for a successful drainage strategy.

It is also proposed to install at least 1no 'Type 2' (200-litre) water butt on each property. Water butts provide small amounts of storage for surface water and can often assist in achieving zero discharge for rainfall depths up to 5mm, which covers 50% of annual rainfall events (according to the EA's Rainfall

Runoff Management for Developments report – SC030219) and means that the 'first flush', which can contain contaminants, does not reach the drainage system.

7.16 The drainage strategy as proposed can be seen in Appendix J of this report, along with sections of the SuDS features. It shows the location of the permeable paviours and SuDS features and the proposed discharges to the ordinary watercourses on the southern and northern boundaries of the site.

7.17 The proposed drainage strategy as laid out in Appendix J has been modelled in MicroDrainage's Network hydraulic modelling module. While the full results of this hydraulic model can be seen in Appendix K of this report, a summary of the proposed runoff rates for different return periods is presented in Table 7.2, below. Due to the FEH data that has been used, a proposed runoff rate for the 1 in 1-year storm is not available and the maximum storm duration available is 5,760-minutes.

Table 7.2: Summary of existing and proposed site runoff rates

Return Period	Proposed Runoff Rate (l/s)
1 in 1	N/A
1 in 2	24.1
1 in 10 (+ 40%)	24.8
1 in 30 (+ 40%)	24.8
1 in 100 (+ 45%)	24.8

7.18 All these runoff rates are marginally below the QBAR greenfield runoff rate for the whole site of 24.9 l/s (5.1 l/s plus 19.8 l/s).

7.19 In summary, the proposed drainage strategy provides the requisite attenuation and all four SuDS pillars, while maintaining the QBAR greenfield runoff rate for the site. The drainage strategy uses the highest available SuDS pillars and is shown not to flood up to and including the 1 in 100-year + 45% rainfall event, inclusive of the impermeable area increases that will result from urban creep. The drainage strategy also complies with local standards and the NPPF (as listed, below), thus is robust in its design and should not be an impediment to the progress of the planning application.

7.20 Between the permeable pavements and the open SuDS features, there is confidence that interception, as required by Standard 2 of the National Standards for SuDS, has been provided. It is recognised that some of the technical criteria of Standard 2 means that infiltration has not been fully provided by each individual SuDS feature on their own, but together and in a SuDS train there is sufficient evidence of interception and the attainment of Standard 2 by the overall drainage system.

Previous Application and LLFA Approval

7.21 This application follows the recent identical application on the site (planning reference DC/24/1699), within which West Sussex County Council (WSCC) as the Lead Local Flood Authority (LLFA) initially objected to the scheme and the drainage strategy. Following dialogue with WSCC and the provision of further details on the drainage strategy, this objection was subsequently removed, and the application was recommended for conditional consent on drainage matters.

7.22 WSCC's initial objection can be seen in Appendix L, and in Appendix M is the LLFA's comments tracker, with each of WSCC's objection points broken down, and the design team's response to each of these points.

7.23 It is this comments tracker, and the information within it provided by the design team, that successfully removed the LLFA's objection, as shown in WSCC's letter of 15th May 2025 (Appendix N).

7.24 Within the LLFA's letter, WSCC requested a condition be placed on a planning application, and within that condition they stated that "t*he scheme shall then be constructed as per the Flood Risk Assessment and Drainage Strategy by Motion, 25th April 2025, issue Final C and remain in perpetuity for the lifetime of the development unless agreed in writing by the Local Planning Authority*". For the LLFA's comfort and confidence in the current proposals, this drainage strategy follows exactly the April 2025 version of the drainage strategy and the details that were approved by the LLFA in May 2025.

7.25 This, along with the design criteria that have been incorporated into the design of the drainage strategy, should facilitate the LLFA's review of the drainage strategy and expedite their approval of the scheme.

Design Criteria

7.26 The drainage strategy has been designed in accordance with the design criteria outlined in WSCC's LLFA Policy for the Management of Surface Water[1].

7.27 This ensures that the current drainage strategy accords with local policy requirements (as well as those of the NPPF). This includes:

- Using FEH 2022 Annual Maximum Catchment data rather than FSR data.
- Using a runoff coefficient (CV) value of 1.0 in all hydraulic modelling
- Reducing the MADD Factor (which assumes 10m^3 of pipe storage per hectare) to zero.
- Urban Creep has been considered and included.
- The full suite of rainfall events has been used (up to the 5,760-minute storm, which is maximum allowable when using FEH data).
- The maximum rainfall intensity has been raised to 550mm/hr to ensure that the full hydrograph is included in the hydraulic calculations.

Urban Creep

7.28 An appropriate allowance should be made for urban creep throughout the lifetime of the development as per 'BS 8582:2013 Code of Practice for Surface Water Management for Developed Sites'.

7.29 This also complies with Standard 3 of the New National Standards for SuDS, which clarifies the expectations with regards to urban creep. It says "*within developments an urban creep uplift factor shall be applied by adding a percentage increase to the calculated area of the impermeable area within the property curtilages. This shall be 10% for all developments unless there are no external private permeable spaces, for example, flats and apartments, when it shall be 0%*."

7.30 Flats and apartments cannot contribute towards urban creep, which means that the apartment block will not contribute to increased future impermeable areas.

7.31 To assume the precautionary principle, a full 10% urban creep has been added to the development's private impermeable areas (roofs and driveways), as per the Table 7.3 on the next page, which shows the uplift to each pipe number in the hydraulic model. Note that any pipes that have not had urban creep applied are not listed within Table 7.3.

[1] https://www.horsham.gov.uk/__data/assets/pdf_file/0019/65017/West-Sussex-Surface-Water-Management-Policy.pdf

Table 7.3: 10% Urban Creep Uplifts Applied to Hydraulic Model

Pipe Number	Total Impermeable Area	Private Impermeable Areas	10% Increase in Private Impermeable Areas	Post-Urban Creep Total Area Applied to Pipe
1.001	640m^2	450m^2	45m^2	685m^2 (0.069ha)
2.001	2,460m^2	1,690m^2	169m^2	2,629m^2 (0.263 ha)
6.001	470m^2	280m^2	28m^2	498m^2 (0.050 ha)
7.001	310m^2	140m^2	14m^2	324m^2 (0.032 ha)
3.001	880m^2	550m^2	55m^2	935m^2 (0.094 ha)
4.001	680m^2	410m^2	41m^2	721m^2 (0.072 ha)
9.001	4,220m^2	1,790m^2	179m^2	4,339m^2 (0.440 ha)
10.001	1,370m^2	630m^2	63m^2	1,433m^2 (0.143 ha)
11.001	950m^2	410m^2	41m^2	991m^2 (0.099 ha)
8.001	550m^2	390m^2	39m^2	589m^2 (0.059 ha)
5.001	410m^2	120m^2	12m^2	422m^2 (0.042 ha)
5.002	780m^2	360m^2	36m^2	816m^2 (0.082 ha)
5.003	1,130m^2	640m^2	64m^2	1,194m^2 (0.119 ha)
4.002	590m^2	100m^2	10m^2	600m^2 (0.060 ha)
3.003	1,100m^2	510m^2	51m^2	1,151m^2 (0.115 ha)
3.004	620m^2	330m^2	33m^2	653m^2 (0.065 ha)
3.005	870m^2	260m^2	26m^2	896m^2 (0.090 ha)

Freeboard

7.32 The SuDS Manual discusses freeboard for drainage strategies and states the following:

"*Ensure that all surface water is retained within the SuDS components for events up to the critical 1:30-year event and contained within appropriate exceedance routes and storage areas up to the critical 1:100-year event, with 300 mm freeboard to points of potential entry to buildings (to meet water quantity standards 3a and 3b), and to include relevant climate change and urban creep allowances*."

We understand that this is also the approach taken by WSCC as the LLFA, and that freeboard should be to the FFL's of the dwellings.

7.33 The approach of 300mm freeboard being measured between the top water level during the critical flood event and points of entry/FFL's of buildings is the approach that Motion have taken and there is 300mm freeboard between the highest water levels and the lowest FFL's on site.

The Drainage Hierarchy

7.34 To deliver SuDS benefits and ensure that a development reduces overall flood risk, there is an established hierarchy of surface water drainage methods that should be considered. The most preferable and sustainable are at the top and the least preferable and least sustainable at the bottom.

7.35 The Planning Practice Guidance to the National Planning Policy Framework (NPPF) states that "*Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable*".

7.36 Standard 1 on the New National Standards for SuDS refines and reinforces this requirement and states that "*runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:*

1. *Priority 1: collected for non-potable use*
2. *Priority 2: infiltrated to ground*
3. *Priority 3: discharged to an above ground surface water body*
4. *Priority 4: discharged to a surface water sewer, or another piped surface water drainage system*
5. *Priority 5: discharged to a combined sewer"*

7.37 This five-tier drainage hierarchy refines the previous eight-tier approach. It has removed drainage solutions that are no longer appropriate (drainage to foul sewers) and focuses on the discharge method rather than how water is attenuated on site.

7.38 With regards to the proposed development and its drainage strategy, the tiers of the drainage hierarchy that have been achieved are outlined in Table 7.4, below. These are the highest available tiers, as demonstrated by the discussion of the geoenvironmental characteristics and constraints discussed in Section 2 of this report.

Table 7.4: Compliance with the Drainage Hierarchy

Tier	Discharge Method	Used?	Notes
1	Collected for non-potable use	ü	Water Butts are to be used on the downpipes of the dwellings.
2	Use infiltration techniques	û	Infiltration is not viable on this site due to the local geology and anticipated groundwater levels.
3	Discharged to an above ground surface water body	ü	The drainage strategy will discharge surface water at the greenfield runoff rate to the surrounding ordinary watercourse network, which have ongoing connectivity.
4	Discharged to a surface water sewer, or another piped surface water drainage system	û	This tier of the drainage hierarchy will not be required.
5	Discharged to a combined sewer	û	This tier of the drainage hierarchy will not be required.

Summary

7.39 The drainage strategy uses the 1st and 3rd tiers of the drainage hierarchy and uses the highest available and site-suitable SuDS features.

MicroDrainage Hydraulic Modelling

7.40 The drainage strategy outlined above has been designed in MicroDrainage's Network hydraulic modelling module.

7.41 The results of the MicroDrainage hydraulic modelling for the proposed development can be seen in Appendix K.

7.42 The results of the hydraulic modelling show that the drainage strategy as outlined in this section can attenuate and discharge all surface water generated in the 1 in 100-year + 45% rainfall event, inclusive of urban creep, and without flooding. This has been achieved while complying with all national and local standards, as outlined in this report.

7.43 The maximum half drain time of the system is 1,072 minutes (in the 1 in 100-year + 45% rainfall event), which is less than the 1,440-minute (24-hour) requirement for this metric in the 1 in 30-year (3.33% AEP) event. The maximum half drain time for all storms is as follows:

- 1 in 2-year: 192 minutes
- 1 in 10-year + 40%: 246 minutes
- 1 in 30 year + 40%: 240 minutes
- 1 in 100-year + 45%: 294 minutes

8.0 Foul Water Drainage

8.1 The peak foul flow rate from the proposed development has been calculated based on Southern Water's foul sewerage modelling criteria. In summary, the calculation is based on the foul flow element, plus an allowance for misconnected surface water. While this is unlikely, it provides a precautionary approach.

8.2 Based on Southern Water's foul sewerage modelling criteria, the calculated design foul flow from the proposed development is 0.74 l/s. However, because of the necessity to drain foul sewage by gravity, this takes foul drainage to the northwest of the site away from the public foul sewer in Bines Road and to a topographic level lower than the invert of the public foul sewer. Consequently, it is necessary to pump foul sewage from the northwest of the site back to Bines Road.

8.3 A location for a foul pump station has been identified on the site layout that provides suitable access for service vehicles and maintains 15m from the wet well to the nearest habitable accommodation.

8.4 While the peak foul flow rate from the development is 0.74 l/s, because the minimum rate at which a foul pump operates is 2.5 l/s to 3.5 l/s (while the pump is on duty), this means that this will periodically be the peak foul discharge rate.

8.5 The ability to make this connection, along with the capacity of the existing 150m diameter foul sewer in Bines Road, and any required network reinforcement will be explored with Southern Water at the appropriate project juncture, along with the surface water drainage connections.

8.6 All Water and Sewerage Companies (WaSC's) have a legal obligation under Section 94 of the Water Industry Act 1991 (the Act) to provide developers with the right to connect to a public sewer regardless of capacity issues. This, in conjunction with Section 91(1) of the Act effectively means that Southern Water cannot object and the LPA cannot refuse to grant planning permission on the grounds of insufficient capacity or that no improvement works are planned for an area. The case precedent for this is a Supreme Court decision in Barratt Homes vs Welsh Water, in which the court held that the developer has an absolute right to connect to the existing sewer, whether or not it overloads the system. It ruled that the specific wording of the legislation allows for this right to be exercised, at no cost to the developer, apart from the normal connection charges.

8.7 Where local sewerage infrastructure constraints are identified, network reinforcements are delivered by the WaSC through New Infrastructure Charges on developers. For non-strategic sites, the WaSC company have a maximum of 24 months to deliver sewerage improvements from the date of the outline or full planning consent.

8.8 New Infrastructure Charge on developers mean that the delivery of improvements to drainage is generally linked to funding made available from approved planning permissions.

8.9 Therefore, if there are any existing capacity issues in the local public foul sewerage, this would be addressed by the network reinforcement process, and the proposed development would bring about an increase in the capacity and condition of the local foul sewerage so that it will have capacity for the new development's foul drainage.

9.0 Surface Water Runoff Quality

9.1 The NPPF states that development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.

9.2 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. With regards to the proposed development, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments, which would be achieved using catchpits and silt traps upstream of the permeable surfacing and throughout the drainage network.

9.3 With regards to the accesses and parking, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from residential car parking and low traffic roads as 'low'. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1. This is discussed, below.

9.4 Table 26.2 of the CIRIA SuDS Manual provides pollution hazard indices for different land use classifications. The land use classification that requires consideration for low traffic roads and parking areas is in Table 9.1 below.

Table 9.1: Excerpt from Table 26.2 of CIRIA SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, homezones and general access roads) with less than 300 traffic movements per day.	Low	0.5	0.4	0.4

9.5 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

9.6 Table 26.3 of the CIRIA SuDS Manual provides indicative SuDS mitigation indices for each SuDS type when discharging to surface waters. Table 9.2, below, which is an excerpt from Table 26.3, shows the mitigation index for permeable paviours.

Table 9.2: Pollution Mitigation Indices for Permeable Pavements

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Permeable Pavements	0.7	0.6	0.7

9.7 The mitigation indices for permeable pavements exceed those of the highest pollution hazard index figures from Table 9.1.

9.8 The site will also include SuDS basins and swales, thus some surface water will pass through two mitigation components. Where two mitigation components are used in series, the SuDS manual states that:

Total SuDS mitigation index = mitigation index (component one) + 0.5 mitigation index (component two)

9.9 The SuDS basin will provide the below mitigation indices as in Table 9.3:

Table 9.3: Pollution Mitigation Indices for Secondary SuDS Feature

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basin	0.25 (0.5 ÷ 2)	0.25 (0.5 ÷ 2)	0.30 (0.6 ÷ 2)

9.10 And the total mitigation indices for the site will be as per Table 9.4, below, which shows the mitigation indices for secondary SuDS features added to the mitigation indices for the primary SuDS feature:

Table 9.4: Total Pollution Mitigation Offered by Permeable Paviours and SuDS Basin:

Contaminant Type	Pollution Hazard Index	Pollution Mitigation Index	Difference
Total Suspended Solids	0.5	0.95 (0.7 + 0.25)	+ 0.45
Metals	0.4	0.85 (0.6 + 0.25)	+ 0.45
Hydrocarbons	0.4	1.00 (0.7 + 0.30)	+ 0.60

9.11 The above evidence shows how the permeable surfaces provide sufficient pollution mitigation on their own, but with the SuDS basin following the permeable paviours, they combine to ensure all pollution hazards are completely mitigated. Where surface water only passes through the SuDS basins prior to discharge the mitigation indices will be as follows in Table 9.5:

Table 9.5: Pollution Mitigation Indices for SuDS Basin

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basin	0.5	0.5	0.6

9.12 Once again, the mitigation indices for the SuDS basin exceed the pollution hazard indices laid out in Table 9.1. This guarantees that every part of the site will receive adequate pollution mitigation prior to surface water being discharged off site.

10.0 Residual Risk and Infrastructure Maintenance

10.1 Whilst the drainage strategy for the development has been designed to attenuate surface water from the 1 in 100-year plus 45% rainfall event, plus an inclusion for urban creep, there could be a small residual risk of flooding due to blockage or failure or poor performance of on-site infrastructure. Therefore, appropriate and regular maintenance of the drainage infrastructure should be undertaken by the site management company or their agents.

10.2 To assist with this process, a Drainage Management and Maintenance Plan has been prepared, which sets out the principles for the long-term management and maintenance of the proposed surface water drainage system on the development. The Drainage Management and Maintenance Plan can be seen in Appendix O.

10.3 The purpose of this document is to ensure that those responsible for site maintenance have a robust inspection and maintenance plan going forwards. This will help ensure the optimum operation of the surface water drainage system and that it will be regularly maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.

11.0 Exceedance Events

11.1 Exceedance events are those greater than the design rainfall event (i.e., greater than the 1 in 100-year rainfall event plus 45% for climate change).

11.2 Any rainfall events greater than the design rainfall event may cause flooding due to them 'exceeding' the capacity of the drainage system. In this situation it is imperative to check whether flooding would occur and, if so, whether it needs to be contained on site. Exceedance flows should not ingress into any properties on site and should not cause nuisance to any neighbouring sites or buildings.

11.3 Because the drainage system is not shown to flood in the MicroDrainage hydraulic model, it has some 'freeboard' within it that would provide attenuation during exceedance events. This allows for the attenuation of some surface water in storms beyond the 1 in 100-year + 45% event.

11.4 Should an exceedance event cause the drainage system to surcharge, the topography of the site and the road network would direct surface water flows and, using these factors as a guide, a high-level plan of exceedance flows has been produced to show the pathway that exceedance flows would take across the site. This can be seen in Appendix P.

12.0 Summary and Conclusion

12.1 This FRA and Drainage Strategy has been produced by Motion on behalf of their client, Croudace Homes Ltd. It supports the full planning application for a 101-unit residential development on the land west of Bines Road, Partridge Green, West Sussex.

12.2 The EA's Flood Map for Planning shows that the proposed development site is entirely within Flood Zone 1. Therefore, the site is at very low risk of flooding from rivers.

12.3 There are some small, isolated areas of 'low' (1 in 1,000-year) surface water flood risk on the site. These areas are in parts of the site where no built development is proposed and, because they originate and quickly terminate within the site, they will no longer be present on the built development due to positive drainage provided by the site's drainage strategy. This means that they would have no on-site or off-site influence and can be disregarded in the context of the built development.

12.4 All other forms of flooding are low/very low risk to the site and the development.

12.5 With the above in mind, flood risk should not form an impediment to the progress of this development as it does not place residents at risk.

12.6 The drainage strategy for the proposed development has been produced in line with the NPPF, the National Standards for SuDS, and WSCC's local standards. It utilises the highest available tiers of the drainage hierarchy and will use a train of SuDS features to provide attenuation, source control, pollution mitigation and amenity and biodiversity benefits. The site's surface water will discharge at no more than the QMED Rural runoff rate, for all storms, to the adjacent ordinary watercourses, which have ongoing connectivity. This means that the drainage also maintains the existing hydraulic regime and health of the watercourses.

12.7 In terms of attenuation, the shared surfaces (which are the tertiary streets and homezones) will be constructed from System C (tanked) permeable paviours. Additional attenuation will be provided through a swale and SuDS basins prior to the final outfalls to the ordinary watercourses.

12.8 This drainage strategy has been hydraulically modelled in MicroDrainage's Network module and has shown that it can attenuate the 1 in 100-year + 45% rainfall event without flooding, with an inclusion for urban creep, as well as using the technical design criteria specified by WSCC as the LLFA.

12.9 The proposed drainage strategy can successfully mitigate the expected pollution hazards that will be generated on site.

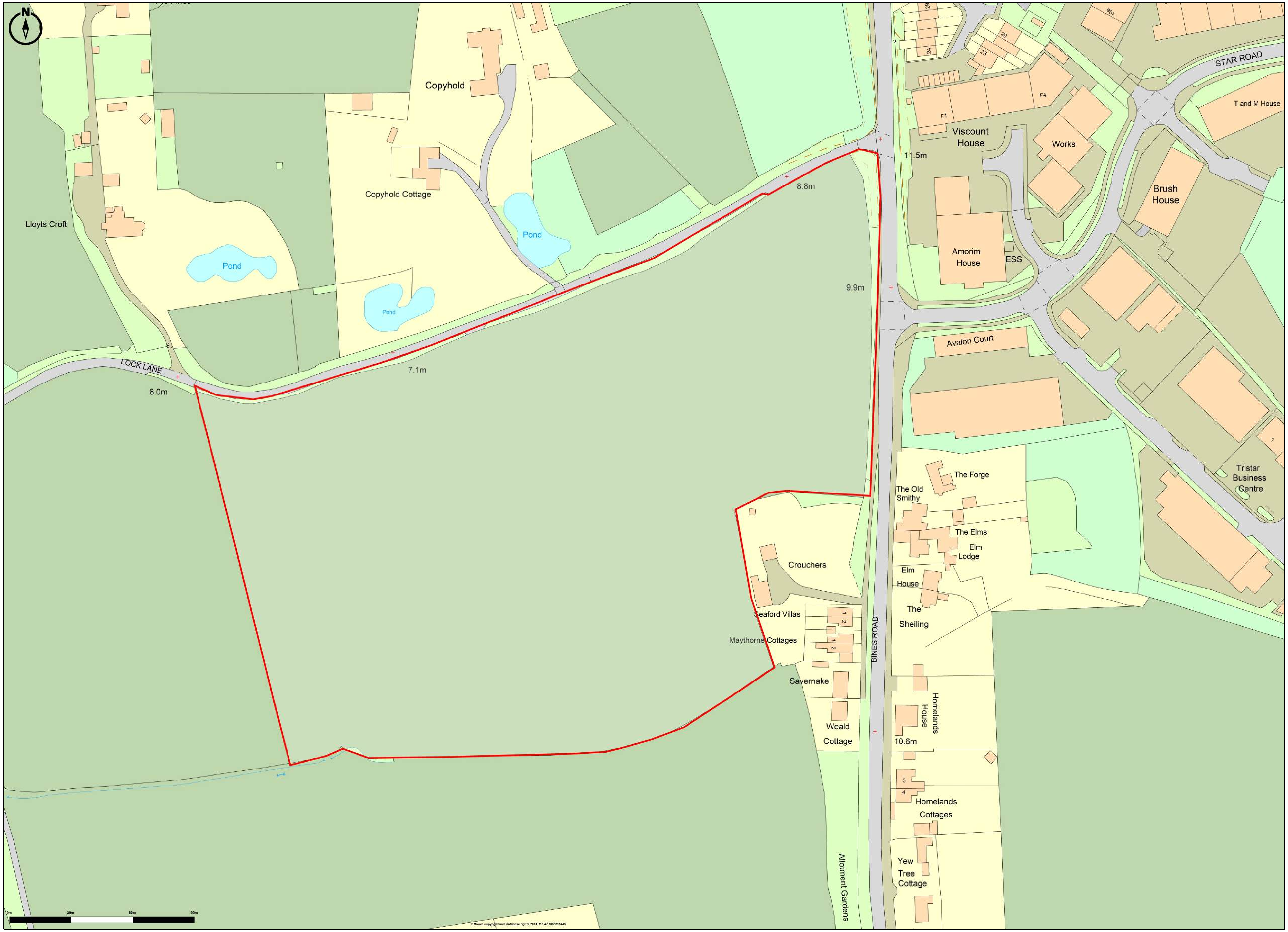
12.10 A drainage management and maintenance plan has been produced that shows how the proposed drainage system (surface water and foul) will be maintained in perpetuity.

12.11 Exceedance flows have been considered and an exceedance plan produced.

12.12 In conclusion, this drainage strategy has shown that the proposed development is at a very low residual risk of flooding, and this makes it appropriate in this location. Similarly, the drainage strategy has shown that the development can manage its foul and surface water sustainably. Therefore, flood risk and surface water management should not form an impediment to the progress of this application, especially because this version of the FRA and drainage strategy and the information submitted with it follows the exact details of the April 2025 version of the FRA and Drainage Strategy ('Final C'), which was approved by the LLFA in their letter of 15^{th} May 2025.

Appendix A

Site Location Plan



Promap
LANDMARK INFORMATION

Plotted Scale - 1:1250. Paper Size - A2

Location Plan

motion

Appendix B

Proposed Development Layout

CDM 2015 Health & Safety Information

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.

Accommodation Schedule

Affordable Dwellings (46no.)

Affordable Rented

6no.	1-Bedroom Flats	(13% 1bed)
1no.	F2005M - 2 Bedroom Coach House	
17no.	A2708M - 2-Bedroom Houses	(39% 2bed)
13no.	A3710M - 3-Bedroom Houses	
5no.	A3711M - 3-Bedroom Houses	(39% 3bed)
4no.	A4714M - 4-Bedroom Houses	(9% 4bed)

Open Market Dwellings (55no.)

2no.	A1702M - 1-Bedroom Flats	(4% 1bed)
11no.	B2009M - 2-Bedroom Houses	(20% 2bed)
2no.	B3015M - 3-Bedroom Houses	
9no.	B3016M - 3-Bedroom Houses	
14no.	B3017M - 3-Bedroom Houses	(45% 3bed)
4no.	S4025M - 4-Bedroom Houses	
4no.	S4029M - 4-Bedroom Houses	
7no.	G4032M - 4-Bedroom Houses	
2no.	G5037M - 5-Bedroom Houses	(31% 4-5bed)

Total; 101 Dwellings

6.33 Ha approx. to Overall Red Line - 16 Dw/Ha

Car Parking Generally;

1.5 space per 1 & 2-Bedroom Flats
2 spaces per 2/3-Bedroom House
2 spaces per 4-Bedroom Affordable House
2 spaces plus Garage per 4/5-Bedroom House
47 Visitor spaces (0.5 spaces/dwelling) *

INDICATIVE LAYOUT ONLY

Rev	Date	Revision Details	Dr	Ch
H	11.09.24	Adjusted to highways comments	LP	KE
G	10.09.24	Adjusted to avoid veteran tree buffers	KE	AK
F	05.09.24	Garage to Plot 1 adjusted	KE	AK
E	05.09.24	Plots 2-8, 52-57 & 75-76 updated	KE	AK
D	03.09.24	Drainage updated, red line adjusted SE corner	KE	AK
C	16.08.24	Layout redesigned following meetings and pre-app	KE	AK
B	07.02.24	Plots 13&14 amended	KE	AK
A	01.02.24	Flats relocated, draiange and footpaths added	KE	AK

London: 76 Great Suffolk Street, London, SE1 0BL
T 0207 928 2773 E london@ecearchitecture.com
Sussex: Brooklyn Chambers, 11 Goring Road, Worthing, West Sussex, BN12 4AP
T 01903 248777 E sussex@ecearchitecture.com
Bristol: Westworks, Colston Tower, Colston Street, Bristol, BS1 4XE
T 0117 214 1101 E bristol@ecewestworks.com
ECE Architecture
www.ecearchitecture.com

Client's Name
Croudace Homes

Job Title
Land at Partridge Green

Drawing Title
Indicative Site Layout

Scale
1:1000 @ A1 / 1:2000 @ A3
metres 20 40 60 80 100

Drawn	Checked	Date
KE	AK	25.11.22

Job No	Drawing No	Rev
7034	PL-02	H

Status
PRELIMINARY

CAD Plot date: 11/09/2024 - 15:34:24 7034-site.dwg