

# TN01 – Drainage & Flood Risk Statement for Permission in Principle Application

Site: Land East of Woodfalls, Loxwood Road, Rudgwick, RH12 3DW  
Prepared by: Phil Allen MCIWEM C.WEM  
Approved by: Neil Jaques  
Date: 12th May 2026

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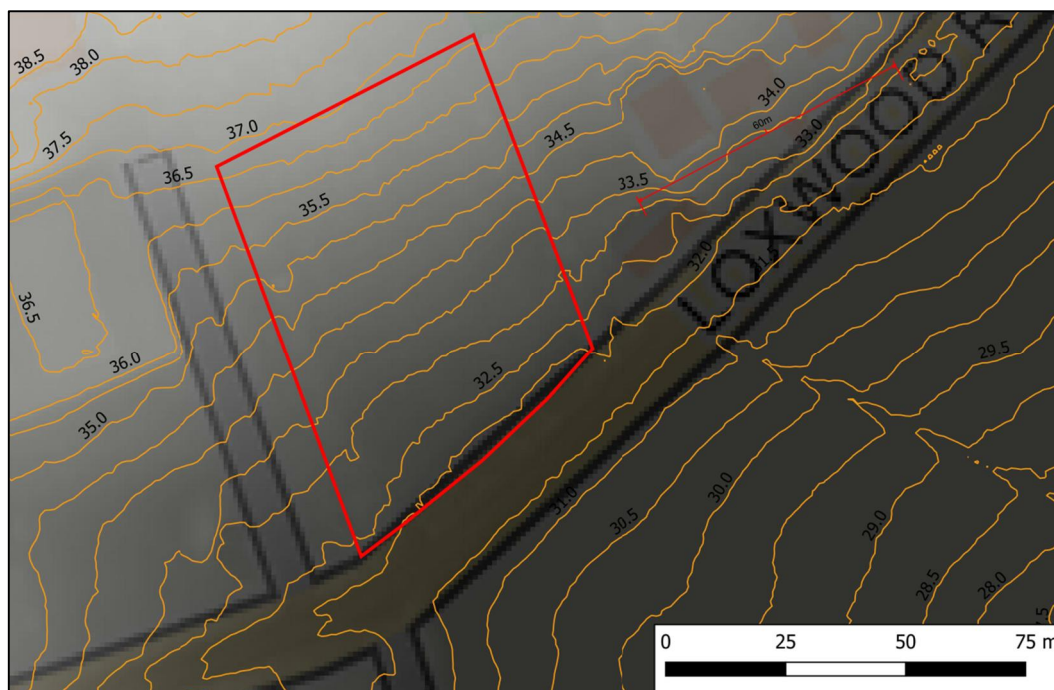
## 1.0 Introduction

- 1.1 This technical note has been prepared by Motion Consultants Ltd to support the Permission in Principle (PiP) application for the proposed development on the Land East of Woodfalls, Loxwood Road, Rudgwick. A site location plan can be found in [Appendix A](#).
- 1.2 The proposed development is for between six and nine dwellings (quantum to be confirmed) plus access, parking and landscaping on the 0.49-hectare greenfield site.
- 1.3 A PiP application seeks to establish whether the location, land use, and quantum of development is acceptable with many technical and detailed design matters reserved for later consent.
- 1.4 To ensure that the proposed development on the Land East of Woodfalls can manage its surface water sustainably, this technical note will outline a suggested drainage strategy for the proposed development. It will highlight the geoenvironmental conditions and constraints, the proposed SuDS requirements, and what discharge locations are available. These factors have informed how the development best be implemented from a drainage perspective.
- 1.5 This technical note will also review all forms of flood risk to understand whether the site is impacted and will assess the development's appropriateness in this location as per the vulnerability categories in the NPPF and its PPG.

## 2.0 Site Information

- 2.1 This section of this technical note will summarise the site characteristics and the geoenvironmental opportunities and constraints so that HDC can consider them in the review of the current proposals and its suggested drainage strategy.
- 2.2 The site lies on the southwestern side of the settlement of Bucks Green, which lies to the southwest of the larger settlement of Rudgwick, which is in Horsham District, West Sussex.
- 2.3 The site is to the northwest of Loxwood Road, which is characterised by low-density development on the northern side of the road, and open fields and farmland on its southern side. The site is therefore in a semi-rural area.
- 2.4 The site is currently greenfield and thinly covered with herbaceous vegetation. At the time of the site visit (early May 2026) the ground was dry and areas of bare soil were present.
- 2.5 Topography has been reviewed using LiDAR data and the outputs of this review can be seen in Figure 2.1, below. The topographic information shows that site falls from northwest to southeast. The highest site elevations are 37.0 metres Above Ordnance Datum (mAOD) on the northwestern boundary and fall to 32.0 mAOD on the site boundary with Loxwood Road. The gradients across the site are relatively even at 1-in-15.

Figure 2.1 – LiDAR-Derived Site Levels and Contours



- 2.6 No intrusive ground investigations have taken place to date, but BGS's Geoindex 1:50,000 mapping has been reviewed. The bedrock geology is described as Weald Clay, which is characterised by thinly bedded mudstones, siltstones and fine- to medium-grained sandstones.
- 2.7 Similar, recent and local planning applications have been reviewed to understand whether any intrusive site investigations had taken place and if they could inform this PiP application.
- 2.8 HDC application DC/25/1269 (Land North of Guildford Road, Rudgwick) is for a 90-unit residential scheme located 500m north of the site. As part of the FRA and Drainage Strategy produced by Paul Basham Associates (PBA) Ground and Water carried out intrusive works and infiltration testing. A summary of the geological strata encountered is shown in Figure 2.2, below.

Figure 2.2 – Geological Strata Encountered in Intrusive Works for DC/25/1269

| Summary of Strata Encountered (TP1 – TP4)                                                                                      |                   |                    |               |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|---------------|
| Strata                                                                                                                         | Top Depth (m bgl) | Base Depth (m bgl) | Thickness (m) |
| <b>TOPSOIL (TP1 – TP4):</b> Greyish brown sandy CLAY. Sand is fine to medium grained.                                          | GL                | 0.30 – 0.45        | 0.30 – 0.45   |
| <b>WEALD CLAY FORMATION (Cohesive) (TP1 – TP3):</b> Orangish brown to grey sandy clay. Sand is fine to medium grained.         | 0.30 – 0.55       | 1.80               | 1.25 – 1.50   |
| <b>WEALD CLAY FORMATION (Cohesive) (TP1):</b> Orangish brown to reddish brown sandy CLAY. Sand is fine grained.                | 0.45              | 0.55               | 0.10          |
| <b>WEALD CLAY FORMATION (Cohesive) (TP1 – TP4):</b> Orangish brown to greyish blue sandy CLAY. Sand is fine to medium grained. | 0.30 – 1.80       | 2.0                | >0.20 – >1.70 |

- 2.9 Figure 2.3 confirms that the local geology is made up of clay-based soils over the Weald Clay Formation.

- 2.10 Asset location plans of the local sewerage were obtained from Southern Water, and these can be seen in [Appendix B](#). There are no public surface water sewers in Loxwood Road or in the wider area.
- 2.11 There is a public foul sewer running past the site in Loxwood Road, and this 150mm diameter pipe flows south-north to join other foul drainage runs emanating from Guildford Road.
- 2.12 The nearest watercourse lies to the north of the site approximately 370 metres up Loxwood Road. This watercourse flows west to east and is a tributary of the River Arun, which passes to the southeast of Rudgwick.
- 2.13 The site currently benefits from a surface water connection to a manhole that sits on the southern boundary of the site (near to the southwestern corner), adjacent to the footpath on the northern side of Loxwood Road. This manhole has a clear unrestricted inflow, and this is shown in Figure 2.3 below. Figure 2.3 was taken from the footpath on the northern side of Loxwood Road, so the pipe shown at the top of the photograph is incoming from the site. Although it is not clear due to the lack of contrast in the photograph, the main flow through the manhole travels from west to east.

*Figure 2.3 – Incoming Surface Water Pipe from Woodfalls to Manhole on Site Boundary*



- 2.14 The west-east pipe run is picked up by another manhole further north on Loxwood Road and also adjacent to the site. This manhole is shown in Figure 2.4 below.

*Figure 2.4 – Surface Water Manhole with Incoming Highways Drainage*



- 2.15 The pipe in the bottom of the image in Figure 2.5 also shows that the manhole picks up water from the road gully that is immediately adjacent to it on Loxwood Road. The proximity between the manhole and road gully is shown in Figure 2.5 below.

*Figure 2.5 – Proximity between Highway Gully and Manhole*



- 2.16 The site topography slopes towards Loxwood Road and there are no bunds or boundary features that would stop site water reaching the highway, such that surface water would naturally drain in this direction and be intercepted by the highway drainage system.

- 2.17 Therefore, there is an existing, connected surface water drainage system serving the site, which interfaces with the highway drainage network. This arrangement has been in place for a period exceeding 20 years and, on this basis, there may be a prescriptive right (under common law) to discharge surface water to this network through long-standing, uninterrupted use, which can be evidenced.
- 2.18 As noted above, no intrusive ground investigations have taken place, but because of the shared geological conditions with the location of the site in DC/25/1269, the outputs of the infiltration testing from PBA's FRA and Drainage Strategy has been referenced.
- 2.19 The infiltration testing, carried out by Ground and Water and to the general principles of BRE365, was undertaken in four trial pits. The results are in Figure 2.6, below.

*Figure 2.6 – Soakage Testing Results from DC/25/1269*

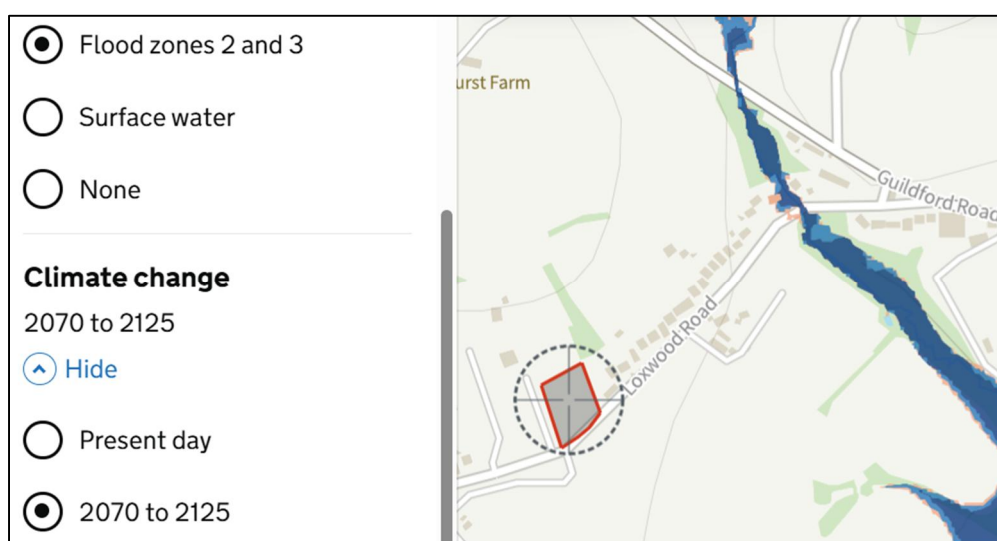
| Trial Hole | Test Number | Base of Soakage Pit (m bgl) | Start Depth (m bgl) | Finish Depth (m bgl) | Time Taken (mins) | Infiltration Rate (m/sec) |
|------------|-------------|-----------------------------|---------------------|----------------------|-------------------|---------------------------|
| TP1*       | 1           | 2.00                        | 0.81                | 0.81                 | 240               | -                         |
| TP2*       | 1           | 2.00                        | 0.75                | 0.75                 | 240               | -                         |
| TP3*       | 1           | 2.00                        | 0.78                | 0.78                 | 240               | -                         |
| TP4*       | 1           | 2.00                        | 0.82                | 0.82                 | 240               | -                         |

- 2.20 As shown by the results in Figure 2.7, no movement of water introduced to the trial pits occurred over four hours. This means that no infiltration rate could be calculated and that the local geology does not support infiltration.
- 2.21 Because the geology is Weald Clay and hydraulically unproductive, it is not considered that groundwater will be an issue with regards to the site and any infrastructure that will be installed therein.

### 3.0 Flood Risk

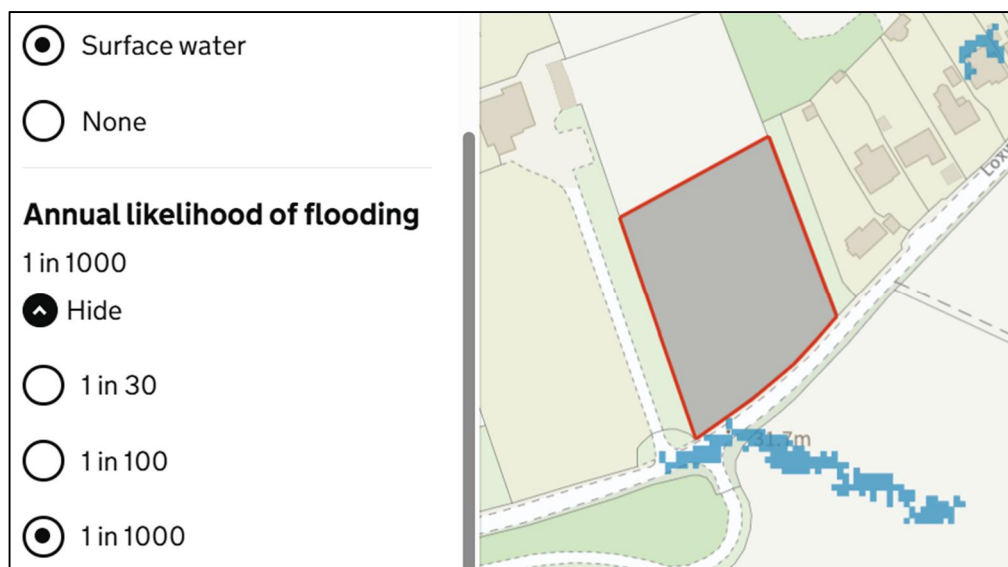
- 3.1 The site is within Flood Zone 1, including the future flood risk scenario with an inclusion for climate change, as shown in Figure 3.1, below. Therefore, the development site is not at fluvial flood risk and no mitigation is required.

*Figure 3.1 – Flood Map for Planning and Fluvial Flood Risk*



- 3.2 Similarly, the site is not within an area at risk of surface water flooding, up to and including the 1 in 1,000-year (0.1% AEP) return period, as shown in Figure 3.2, below.

*Figure 3.2 – Surface Water Flood Risk in 0.1 % AEP Return Period*



- 3.3 Other forms of flood risk are expected to be low or very low (infrastructure failure, reservoirs, canals) and because of the hydraulically unproductive local geology, groundwater is not expected to be a constraint on site or be affected by the development.
- 3.4 This means that flood risk is not a constraint to the development, and the Sequential Test does not need to be applied.

## 4.0 Development Hydrology

- 4.1 As noted above, the site is expected to support a development for between six and nine dwellings, plus access, parking, landscaping and SuDS. A development layout based upon seven units has been prepared, and this can be seen in [Appendix C](#).
- 4.2 The impermeable areas in the plan in [Appendix C](#), which would contribute to surface water on the site, have been measured. The overall site area is 0.49 ha and the impermeable areas within the site measure 0.16 ha. This is the area that would require positive drainage, thus forms the basis of the greenfield runoff rate that must be achieved for an offsite surface water discharge.
- 4.3 The QMED greenfield runoff rate, which has been calculated using FEH 2022 rainfall data, has been calculated for the 0.16 ha of impermeable areas that are expected. The QMED greenfield runoff rate is 2.5 l/s, as exhibited, below, in Figure 4.1.

Figure 4.1 – QMED Greenfield Runoff Rate

| FEH Input     |                                 | Median Annual Flood (QMED) |       | Results          |
|---------------|---------------------------------|----------------------------|-------|------------------|
| QMED Method   | 2008                            | BFIHOST                    | 0.278 | QMED rural (l/s) |
| Site Location | GB 507750 132950 TQ 07750 32950 | FARL                       | 1.000 | 2.5              |
| Area (ha)     | 0.160                           |                            |       | QMED Urban (l/s) |
| SAAR (mm)     | 777                             |                            |       | 2.5              |
| SPRHOST       | 49.240                          |                            |       |                  |
| URBEXT        | 1990                            |                            |       |                  |
|               | 0.0049                          | Calculate                  |       |                  |

- 4.4 This QMED greenfield runoff rate of 2.5 l/s sets the maximum allowable discharge rate for the development.
- 4.5 As noted earlier in this report, the proposed quantum of development is between six and nine units. The impermeable areas have been calculated from the layout of seven units. Should the number of units increase to nine dwellings, the average dwelling size will reduce, and the overall impermeable areas are expected to be similar to that of the site layout for seven units.

## 5.0 The Proposed Drainage Strategy

- 5.1 As noted above, the local geology and nearby geotechnical site investigations have established that infiltration is highly unlikely to be viable on the site. As such, the suggested drainage strategy for the development will be based upon attenuation and offsite discharge.
- 5.2 The suggested drainage strategy will also be based upon the principles of the New National Standards for SuDS, primarily that the most sustainable option for surface water discharge should prevail and that interception and the retention of the first 5mm of rainfall on site, as Standard 2 prescribes, is incorporated into the developed site.
- 5.3 It is suggested that accesses and other public vehicular space be constructed from System C (tanked) permeable pavements. This will provide source control for rainfall falling directly onto these areas. Surrounding hardstanding and perhaps also roof areas and driveways can also discharge directly into the subbase of the permeable surfacing. This will provide source control, pollution mitigation and some elements of interception.
- 5.4 It is also recommended that at least 1no. 'Type 2' (200-litre) rainwater butt is installed 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. It is recognised that this does not achieve true 'interception', as prescribed by Standard 2 of the New National Standards for SuDS. Nevertheless, water butts will provide a useful source of non-potable water for uses around the home and garden, and will reduce the amount of water reaching the below-ground drainage systems.
- 5.5 As well as the permeable pavements, an open SuDS feature will be proposed, which will also offer visual 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). This will be in the form of an attenuation basin, and it is proposed that this be located in the southwest corner of the site. This SuDS basin will provide the attenuation requirements for the development and an attractive landscape feature on the site boundary with Loxwood Road.

- 5.6 As discussed in Section 2, the site already benefits from a surface water outfall that discharges at an unrestricted rate to a surface water drain that is shared by the local highways drainage system. It is therefore proposed to continue this established hydraulic regime and connect the development's surface water discharge into the existing surface water pipe, which flows into the manhole on Loxwood Road.
- 5.7 The surface water outflow from the site will be at no greater than the QMED greenfield runoff rate for the site's expected impermeable areas of 0.16 ha. This is 2.5 l/s, and this discharge rate will be maintained for all rainfall events, up to and including the 1 in 100-year + 45% storm. Therefore, for higher order rainfall events, the site will reduce the surface water runoff rate over the existing situation.
- 5.8 The drainage strategy for the development has been modelled in MicroDrainage's Source Control hydraulic modelling module to understand the attenuation requirements for 0.16 ha of contributing areas during the 1 in 100-year + 45% rainfall event and while discharging at no greater than the 2.5 l/s.
- 5.9 The full results of the Source Control hydraulic model can be seen in [Appendix D](#) of this report. They show that an attenuation basin one metre deep, with 1 in 3 side slopes, and with a volume of 125m<sup>3</sup> (which results in a surface area of 183m<sup>2</sup>) is needed, and it can attenuate and discharge the 1 in 100-year + 45% rainfall event without flooding. A spatial representation of this attenuation basin within the seven-unit site layout can be seen in Figure 5.1, below.

*Figure 5.1 - Size and Suggested Location of Proposed SuDS Basin*



- 5.10 The location of the SuDS Basin is appropriate in terms of the contours and topography of the site (being aligned with them) and places it close to the existing piped surface water discharge from the site, which it can connect to by gravity.
- 5.11 The drainage strategy outlined above means that the LPA and LLFA can be confident that the proposed development on the Land East of Woodfalls can attenuate and discharge its surface water sustainably and do so in accordance with the principles of the NPPF and the New National Standards for SuDS (this is discussed in Section 7.0). There is an established surface water outfall for the site, which will be maintained and its use will preserve the existing hydraulic regime, without increasing surface water runoff from the site over the greenfield state. As can be seen from Figure 5.1, a SuDS basin would form a proportionate structure within the site and would add to the amenity value of the development and provide a sense of space at the entrance to the site.

## 6.0 Surface Water Runoff Quality

- 6.1 The proposed drainage strategy will accord with the pollution mitigation requirements of Chapter 26 of the CIRIA SuDS Manual.
- 6.2 The site would present a 'low' pollution hazard. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1.
- 6.3 The pollution hazard indices associated with a 'low' pollution risk site can be mitigated using permeable pavements and the SuDS basin. Both features have pollution mitigation indices that exceed pollution hazard indices associated with a 'low' pollution risk site.
- 6.4 As such, no further pollution mitigation devices or intervention is needed on the site, and the pollution mitigation strategy is suitable for a site within groundwater SPZ3.

## 7.0 Compliance with the National Standards for SuDS

- 7.1 This section will review how the proposed drainage strategy achieves the seven core standards within the National Standards for SuDS. This is presented below.

### Standard 1 – Runoff destinations (Drainage hierarchy) -

- 7.2 With regards to the proposed development and its suggested drainage strategy, the tiers of the drainage hierarchy that have been achieved are outlined in the table 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.

### Compliance with Standard 1 and the Drainage Hierarchy

| Tier | Discharge Method                                                                    | Used? | Notes                                                              |
|------|-------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------|
| 1    | Collected for non-potable use                                                       | ü     | Water Butts are to be used on the dwellings.                       |
| 2    | Use infiltration techniques                                                         | û     | Infiltration is unlikely to be viable in this location.            |
| 3    | Discharged to an above ground surface water body                                    | û     | This tier of the drainage hierarchy is not available.              |
| 4    | Discharged to a surface water sewer, or another piped surface water drainage system | ü     | This tier of the drainage hierarchy is available and will be used. |
| 5    | Discharged to a combined sewer                                                      | û     | This tier of the drainage hierarchy will not be required.          |

### Standard 2 – Management of everyday rainfall (interception) - ü

- 7.3 Water butts will be fitted to all properties. Permeable pavements are suggested for public vehicle areas. An open SuDS basin is also proposed. Between the permeable pavements and the open SuDS feature, 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.

### Standard 3 – Management of extreme rainfall and flooding - ü

- 7.4 The hydraulic modelling carried out in MicroDrainage's Source Control Module, as presented in [Appendix C](#), shows that the proposed development can manage all surface water arising from impermeable areas during the extreme rainfall event without flooding.

### Standard 4 – Water quality- ü

- 7.5 The drainage strategy for the development can mitigate all expected pollution hazards that will arise on site using the specified SuDS features, complying with the requirements of Chapter 26 of the CIRIA SuDS Manual (C753).

### Standard 5 – Amenity- ü

- 7.6 The proposed drainage strategy uses surface level SuDS, that tie into the landscape and provide visual interest and a sense of space. The permeable pavements will also provide an interesting textured surface to increase visual appeal (over tarmac for example).

### Standard 6 – Biodiversity - ü

- 7.7 The SuDS strategy uses a SuDS basin, which can be planted and maintained to provide biodiversity benefits and will support BNG targets, as required.

## Standard 7 – Design for construction, operation, maintenance, and structural integrity- ü

- 7.8 By using surface-level SuDS in the drainage strategy, a system that is safe to construct and is sustainable to use and maintain, and safely integrates into the development, has been specified.
- 7.9 A clear and detailed management and maintenance plan will be produced, which will specify how the drainage system should be maintained in perpetuity.

### 8.0 Foul Drainage Strategy

- 8.1 The Southern Water Asset Location Plan in **Appendix B** shows that there is a public foul sewer passing the site's southern boundary. This public foul sewer lies adjacent to the lowest part of the site, so it will be possible to connect the proposed development's foul waste to this system by gravity.
- 8.2 No capacity check has been carried out to date as part of this PiP application. This will be carried out in due course.
- 8.3 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.
- 8.4 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 a 'firm commitment to the development'. This is usually the date of the outline or full planning consent.
- 8.5 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 The Permission in Principle Application

- 9.1 This assessment of flood risk and drainage for the proposed development at Land East of Woodfalls demonstrates that surface water arising from the site can be sustainably managed through appropriate attenuation and controlled discharge techniques. The proposed approach will ensure that runoff rates and volumes do not exceed greenfield conditions, thereby preventing any increase in flood risk either on-site or to surrounding land.
- 9.2 Furthermore, a review of all potential sources of flooding indicates that the site is at low risk and can be developed safely with the implementation of standard mitigation measures.
- 9.3 As flood risk and drainage are material planning considerations, these findings provide the LPA and LLFA with confidence at the PiP stage that these matters would not act as a constraint to development. It is therefore appropriate that detailed drainage design, including final layout, sizing of attenuation features, and discharge arrangements, be secured and agreed at the subsequent Technical Details consent stage.

### 10.0 Summary and Conclusion

- 10.1 This Technical Note has assessed the flood risk and surface water drainage considerations associated with the proposed residential development at Land East of Woodfalls, Loxwood Road, Rudgwick, to ensure that they are submitted at Permission in Principle (PiP) stage.
- 10.2 All potential sources of flood risk have been considered, including fluvial, pluvial, groundwater and artificial sources. The site is located entirely within Flood Zone 1 and is not shown to be at risk of surface water

flooding, even during extreme rainfall events. Other sources of flooding are also considered to pose a low or negligible risk. As such, flood risk does not present a constraint to the proposed development.

- 10.3 A review of site conditions, including topography, geology and local drainage infrastructure, has established that the site is underlain by Weald Clay, which is not conducive to infiltration. This is corroborated through intrusive testing carried out in nearby, recent developments. Consequently, a drainage strategy based on attenuation and controlled discharge has been identified as the appropriate approach.
- 10.4 A sustainable drainage strategy has been developed in accordance with the NPPF and the Non-Statutory Technical Standards for SuDS. This incorporates source control measures, including permeable paving and rainwater butts, together with an attenuation basin to manage runoff from the development. Surface water will be discharged at a restricted rate equivalent to the greenfield runoff rate (2.5 l/s), ensuring that there is no increase in runoff rates or volumes from the site.
- 10.5 The site benefits from an established surface water outfall that is shared by the local highway drainage network. The suggested drainage strategy for the development would utilise this existing connection and maintain the current hydraulic regime while ensuring compliance with the drainage hierarchy.
- 10.6 Hydraulic modelling demonstrates that the proposed attenuation features can accommodate surface water runoff up to and including the 1 in 100-year plus 45% climate change event without flooding. In addition, the suggested drainage strategy provides water quality treatment, amenity value and biodiversity benefits in accordance with SuDS best practice.
- 10.7 Overall, the findings of this assessment confirm that surface water arising from the proposed development can be managed sustainably without increasing flood risk elsewhere and without exposing the site to unacceptable flood risk. This means that surface water and flood risk are not a constraint to the proposed development of the Land East of Woodfalls.
- 10.8 Because flood risk and drainage are material planning considerations, this technical note provides the Local Planning Authority (LPA) and Lead Local Flood Authority (LLFA) with confidence at the PIP stage that these matters will not act as an impediment to development. Detailed design of the drainage system can therefore be appropriately secured and agreed at the Technical Details consent stage.

## Appendix A

Site Location Plan



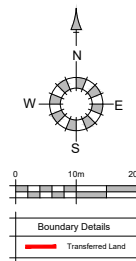
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|-------------------------------------------------------------------------|------|------------|----|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------|---|---------------------------------------------------------------------------------------|
| REV.                                                                    | DATE | REVISIONS: | BY | STATUS: | CLIENT: Greenplan Designer Homes                                                                                                                                                                                                                                                                                                                                                                                                                |       | PROJECT: Woodfalls, Loxwood Road, Bucks Green<br>RH12 3DW |   |  |
|                                                                         |      |            |    |         | SCALE: 1:1250 (A4 ORIGINAL)                                                                                                                                                                                                                                                                                                                                                                                                                     |       | DRAWING: Transfer Plan                                    |   |                                                                                       |
|                                                                         |      |            |    |         | DRAWN: RPO<br>DATE: 07.10.25                                                                                                                                                                                                                                                                                                                                                                                                                    | 25022 | L101                                                      | - |                                                                                       |
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## Appendix B

### Southern Water Asset Location Plans





## Appendix C

### Indicative Seven Unit Scheme Layout



Sketch Site Layout  
25022 Woodfalls, Loxwood Road, Bucks Green  
**25022 / SK03**

Scale 1:500 @ A3 February 2025

## Appendix D

### MicroDrainage Source Control Hydraulic Model Outputs

|                                                             |               |                                                                                     |                       |                  |            |
|-------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------|-----------------------|------------------|------------|
| Motion                                                      |               | Page 1                                                                              |                       |                  |            |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU              |               |  |                       |                  |            |
| Date 12/05/2026 11:15                                       |               |                                                                                     |                       |                  |            |
| File lgpbc-Basin Design.SRCX                                |               |                                                                                     |                       |                  |            |
| Innovyze                                                    |               | Designed by CommonUser<br>Checked by                                                |                       |                  |            |
|                                                             |               | Source Control 2020.1.3                                                             |                       |                  |            |
| <u>Summary of Results for 100 year Return Period (+45%)</u> |               |                                                                                     |                       |                  |            |
| Storm Event                                                 | Max Level (m) | Max Depth (m)                                                                       | Max Control (l/s)     | Max Volume (m³)  | Status     |
| 15 min Summer                                               | 32.075        | 0.575                                                                               | 2.5                   | 54.8             | O K        |
| 30 min Summer                                               | 32.221        | 0.721                                                                               | 2.5                   | 74.6             | Flood Risk |
| 60 min Summer                                               | 32.352        | 0.852                                                                               | 2.5                   | 94.7             | Flood Risk |
| 120 min Summer                                              | 32.434        | 0.934                                                                               | 2.5                   | 108.4            | Flood Risk |
| 180 min Summer                                              | 32.467        | 0.967                                                                               | 2.5                   | 114.3            | Flood Risk |
| 240 min Summer                                              | 32.479        | 0.979                                                                               | 2.5                   | 116.5            | Flood Risk |
| 360 min Summer                                              | 32.473        | 0.973                                                                               | 2.5                   | 115.3            | Flood Risk |
| 480 min Summer                                              | 32.455        | 0.955                                                                               | 2.5                   | 112.3            | Flood Risk |
| 600 min Summer                                              | 32.437        | 0.937                                                                               | 2.5                   | 109.0            | Flood Risk |
| 720 min Summer                                              | 32.418        | 0.918                                                                               | 2.5                   | 105.8            | Flood Risk |
| 960 min Summer                                              | 32.381        | 0.881                                                                               | 2.5                   | 99.5             | Flood Risk |
| 1440 min Summer                                             | 32.311        | 0.811                                                                               | 2.5                   | 88.3             | Flood Risk |
| 2160 min Summer                                             | 32.212        | 0.712                                                                               | 2.5                   | 73.4             | Flood Risk |
| 2880 min Summer                                             | 32.100        | 0.600                                                                               | 2.5                   | 58.1             | O K        |
| 4320 min Summer                                             | 31.896        | 0.396                                                                               | 2.5                   | 34.1             | O K        |
| 5760 min Summer                                             | 31.763        | 0.263                                                                               | 2.5                   | 20.9             | O K        |
| 15 min Winter                                               | 32.075        | 0.575                                                                               | 2.5                   | 54.8             | O K        |
| 30 min Winter                                               | 32.221        | 0.721                                                                               | 2.5                   | 74.6             | Flood Risk |
| 60 min Winter                                               | 32.353        | 0.853                                                                               | 2.5                   | 94.9             | Flood Risk |
| 120 min Winter                                              | 32.436        | 0.936                                                                               | 2.5                   | 108.9            | Flood Risk |
| 180 min Winter                                              | 32.471        | 0.971                                                                               | 2.5                   | 115.1            | Flood Risk |
| 240 min Winter                                              | 32.485        | 0.985                                                                               | 2.5                   | 117.5            | Flood Risk |
| 360 min Winter                                              | 32.481        | 0.981                                                                               | 2.5                   | 116.8            | Flood Risk |
| 480 min Winter                                              | 32.461        | 0.961                                                                               | 2.5                   | 113.2            | Flood Risk |
| 600 min Winter                                              | 32.438        | 0.938                                                                               | 2.5                   | 109.1            | Flood Risk |
| 720 min Winter                                              | 32.415        | 0.915                                                                               | 2.5                   | 105.3            | Flood Risk |
| 960 min Winter                                              | 32.366        | 0.866                                                                               | 2.5                   | 97.0             | Flood Risk |
| 1440 min Winter                                             | 32.263        | 0.763                                                                               | 2.5                   | 80.8             | Flood Risk |
| 2160 min Winter                                             | 32.078        | 0.578                                                                               | 2.5                   | 55.3             | O K        |
| 2880 min Winter                                             | 31.896        | 0.396                                                                               | 2.5                   | 34.1             | O K        |
| 4320 min Winter                                             | 31.678        | 0.178                                                                               | 2.4                   | 13.4             | O K        |
| 5760 min Winter                                             | 31.601        | 0.101                                                                               | 2.1                   | 7.2              | O K        |
| Storm Event                                                 | Rain (mm/hr)  | Flooded Volume (m³)                                                                 | Discharge Volume (m³) | Time-Peak (mins) |            |
| 15 min Summer                                               | 143.376       | 0.0                                                                                 | 57.4                  | 26               |            |
| 30 min Summer                                               | 98.136        | 0.0                                                                                 | 78.7                  | 40               |            |
| 60 min Summer                                               | 63.887        | 0.0                                                                                 | 102.6                 | 70               |            |
| 120 min Summer                                              | 38.592        | 0.0                                                                                 | 123.9                 | 126              |            |
| 180 min Summer                                              | 28.551        | 0.0                                                                                 | 137.5                 | 184              |            |
| 240 min Summer                                              | 22.950        | 0.0                                                                                 | 147.4                 | 244              |            |
| 360 min Summer                                              | 16.731        | 0.0                                                                                 | 161.2                 | 358              |            |
| 480 min Summer                                              | 13.344        | 0.0                                                                                 | 171.4                 | 412              |            |
| 600 min Summer                                              | 11.177        | 0.0                                                                                 | 179.5                 | 474              |            |
| 720 min Summer                                              | 9.658         | 0.0                                                                                 | 186.1                 | 536              |            |
| 960 min Summer                                              | 7.648         | 0.0                                                                                 | 196.5                 | 672              |            |
| 1440 min Summer                                             | 5.499         | 0.0                                                                                 | 211.9                 | 946              |            |
| 2160 min Summer                                             | 3.966         | 0.0                                                                                 | 229.4                 | 1364             |            |
| 2880 min Summer                                             | 3.156         | 0.0                                                                                 | 243.4                 | 1756             |            |
| 4320 min Summer                                             | 2.302         | 0.0                                                                                 | 266.2                 | 2424             |            |
| 5760 min Summer                                             | 1.856         | 0.0                                                                                 | 286.3                 | 3104             |            |
| 15 min Winter                                               | 143.376       | 0.0                                                                                 | 57.4                  | 26               |            |
| 30 min Winter                                               | 98.136        | 0.0                                                                                 | 78.7                  | 40               |            |
| 60 min Winter                                               | 63.887        | 0.0                                                                                 | 102.6                 | 68               |            |
| 120 min Winter                                              | 38.592        | 0.0                                                                                 | 123.9                 | 124              |            |
| 180 min Winter                                              | 28.551        | 0.0                                                                                 | 137.5                 | 182              |            |
| 240 min Winter                                              | 22.950        | 0.0                                                                                 | 147.4                 | 238              |            |
| 360 min Winter                                              | 16.731        | 0.0                                                                                 | 161.2                 | 348              |            |
| 480 min Winter                                              | 13.344        | 0.0                                                                                 | 171.4                 | 450              |            |
| 600 min Winter                                              | 11.177        | 0.0                                                                                 | 179.5                 | 484              |            |
| 720 min Winter                                              | 9.658         | 0.0                                                                                 | 186.1                 | 560              |            |
| 960 min Winter                                              | 7.648         | 0.0                                                                                 | 196.5                 | 714              |            |
| 1440 min Winter                                             | 5.499         | 0.0                                                                                 | 211.9                 | 1016             |            |
| 2160 min Winter                                             | 3.966         | 0.0                                                                                 | 229.4                 | 1432             |            |
| 2880 min Winter                                             | 3.156         | 0.0                                                                                 | 243.4                 | 1760             |            |
| 4320 min Winter                                             | 2.302         | 0.0                                                                                 | 266.2                 | 2376             |            |
| 5760 min Winter                                             | 1.856         | 0.0                                                                                 | 286.3                 | 2992             |            |
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|                                |                         |                                                                                     |
|--------------------------------|-------------------------|-------------------------------------------------------------------------------------|
| Motion                         |                         | Page 2                                                                              |
| 84 North Street                |                         |  |
| Guildford                      |                         |                                                                                     |
| Surrey GU1 4AU                 |                         |                                                                                     |
| Date 12/05/2026 11:15          | Designed by CommonUser  |                                                                                     |
| File lgp buc-Basin Design.SRCX | Checked by              |                                                                                     |
| Innovyze                       | Source Control 2020.1.3 |                                                                                     |

Rainfall Details

|                       |                                 |                       |       |
|-----------------------|---------------------------------|-----------------------|-------|
| Rainfall Model        | FEH                             | Winter Storms         | Yes   |
| Return Period (years) | 100                             | Cv (Summer)           | 1.000 |
| FEH Rainfall Version  | 2013                            | Cv (Winter)           | 1.000 |
| Site Location         | GB 507750 132950 TQ 07750 32950 | Shortest Storm (mins) | 15    |
| Data Type             | Catchment                       | Longest Storm (mins)  | 5760  |
| Summer Storms         | Yes                             | Climate Change %      | +45   |

Time Area Diagram

Total Area (ha) 0.161

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|
| From:       | To:       | From:       | To:       | From:       | To:       |
| 0           | 4         | 4           | 8         | 8           | 12        |
| 0.053       | 0.054     | 0.053       | 0.053     |             |           |

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|                                                |                         |                                                                                     |
|------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                         | Page 3                                                                              |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU |                         |  |
| Date 12/05/2026 11:15                          | Designed by CommonUser  |                                                                                     |
| File lgpbc-Basin Design.SRCX                   | Checked by              |                                                                                     |
| Innovyze                                       | Source Control 2020.1.3 |                                                                                     |

### Model Details

Storage is Online Cover Level (m) 32.500

### Tank or Pond Structure

Invert Level (m) 31.500

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 67.2                   | 1.000     | 182.7                  |

### Hydro-Brake® Optimum Outflow Control

|                   |                            |                                   |        |
|-------------------|----------------------------|-----------------------------------|--------|
| Unit Reference    | MD-SHE-0075-2500-1000-2500 | Sump Available                    | Yes    |
| Design Head (m)   | 1.000                      | Diameter (mm)                     | 75     |
| Design Flow (l/s) | 2.5                        | Invert Level (m)                  | 31.500 |
| Flush-Flo™        | Calculated                 | Minimum Outlet Pipe Diameter (mm) | 100    |
| Objective         | Minimise upstream storage  | Suggested Manhole Diameter (mm)   | 1200   |
| Application       | Surface                    |                                   |        |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 1.000    | 2.5        | Kick-Flo®                 | 0.627    | 2.0        |
| Flush-Flo™                | 0.307    | 2.5        | Mean Flow over Head Range | -        | 2.2        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 2.1        | 0.600     | 2.1        | 1.600     | 3.1        | 2.600     | 3.9        | 5.000     | 5.3        | 7.500     | 6.4        |
| 0.200     | 2.4        | 0.800     | 2.3        | 1.800     | 3.3        | 3.000     | 4.1        | 5.500     | 5.5        | 8.000     | 6.6        |
| 0.300     | 2.5        | 1.000     | 2.5        | 2.000     | 3.4        | 3.500     | 4.5        | 6.000     | 5.7        | 8.500     | 6.8        |
| 0.400     | 2.5        | 1.200     | 2.7        | 2.200     | 3.6        | 4.000     | 4.7        | 6.500     | 6.0        | 9.000     | 7.0        |
| 0.500     | 2.4        | 1.400     | 2.9        | 2.400     | 3.7        | 4.500     | 5.0        | 7.000     | 6.2        | 9.500     | 7.1        |