

FLOOD RISK & DRAINAGE TECHNICAL NOTE

PROPOSED RESIDENTIAL DEVELOPMENT
OLD SARUM
SAILSBURY
SP4 6FH

PREPARED FOR: Persimmon Homes (Wessex) Ltd

JOB NO: P23-295

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DOCUMENT HISTORY

Issue No.	Description	Date
1	First Issue	13/10/23
2	SuDS Drainage System Section Added	04/07/24

1. INTRODUCTION

- 1.1 Simpson TWS has prepared this report on behalf of Persimmon Homes, in support of a full planning application for a proposed residential development at the land north of Bunting Lane, Old Sarum, Wiltshire, SP4 6FH.
- 1.2 This report serves as an addendum to a flood risk assessment (FRA) by Cole Easdon Consultants (CEC), dated April 2021. The principle of the development remains the same, with any changes addressed in this report.

2. SITE DISCRIPTION AND TOPOGRAPHY

- 2.1 The site is a 1.0 hectare greenfield site located off Roger Way, surrounded by recently built properties and a football stadium to the south. The local topography slopes westward toward a dry valley on the northwestern side. The land within the site also slopes southwest, with elevations ranging from 74.60m at Rogers Way in the north to 72.50m in the southwestern area, as noted in CEC's FRA.
- 2.2 The development produces greenfield runoff of 1.7 l/s in a 1 in 100 year flood event, as reported in CEC's FRA. The lower runoff rates are due to the site's chalk strata, which has good water infiltration properties.

3. FLOOD RISK

- 3.1 The flood risk assessment conducted by Cole Easdon Consultants (CEC) (April 2021) classifies the site as being in Flood Zone 1, this is still the case, therefore, making the proposed development deemed acceptable.
- 3.2 CEC's flood risk assessment indicates the site being susceptible to surface water flooding due to overland flow, hence, it is proposed to include appropriate overland flow routes via the proposed developments new carriageway.
- 3.3 There was no flood risk indicated in CEC's flood risk assessment report and this is still the case, hence, the proposed development is considered acceptable.

4. DRAINAGE STRATEGY

- 4.1 The site's previous layout featured 0.57 ha of impermeable surfaces, which included 0.39 ha of roofs, private parking/driveways, and 0.18 ha of road areas. To account for potential future extensions and development, a 10% urban creep factor was applied to the private areas, resulting in a total impermeable area of 0.61 ha.
- 4.2 In the latest site layout, there is 0.44 ha of impermeable area in total, comprising 0.33 ha of roof area and private parking/driveways, along with 0.113 hectares of road. Incorporating a 10% urban creep factor into this layout increases the total impermeable area to 0.48 ha.

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- 4.3 The previous approach to managing surface water runoff from the development site was through infiltration methods. This involved a network of interconnected infiltration basins and swales located along the northwestern boundary, as well as the utilization of soakaways and permeable paving. To ensure the viability of this approach, infiltration tests were conducted across the site, confirming the suitability of the underlying Chalk strata for infiltration-based drainage.
- 4.4 The updated drainage strategy, as outlined in drawings P23-295-SK102 and P23-295-SK103, continues to incorporate infiltration techniques. Roof and impermeable driveway runoff are directed into an underground drainage system, which is then conveyed to an infiltration basin positioned along the western boundary of the site. This infiltration basin is designed to dispose of surface water runoff from all storm events, including the 1 in 100-year storm event, with a 45% allowance for climate change.
- 4.5 Similarly, the permeable driveways are designed to facilitate the infiltration of surface water into the ground, ensuring they can accommodate surface water runoff from all storm events, including a 1 in 100 year storm event, with 45% allowance for climate change.
- 4.6 The surface water strategy for the wider site allowed for 5380m³ roof runoff to drain to the site wide surface water network. However, in the updated proposal, roof runoff is conveyed to an infiltration basin. The only area discharging to the sewer in Rogers Way is 1134.3m², runoff from the developments proposed adoptable carriageway.
- 4.7 It is proposed to discharge foul water from the proposed development into the foul sewer situated at Roger Way, as indicated in drawings P23-295-SK102 and P23-295-SK103. According to the flood risk assessment report by CEC, this sewer eventually leads to a foul water pumping station positioned in the southwestern portion of the wider site, accessible from Castle Well Drive. This pumping station was engineered to handle foul water from the larger Old Sarum development.

5. Sustainable Drainage System

- 5.1 Sustainable Drainage features as well as being utilised to provide attenuation for the development are utilised to provide surface water treatment. This treatment is required to protect the water and ecosystems down the catchment.
- 5.2 CIRIA report C753 The SuDS Manual outlines the methodology for assessing water quality risks associated with new developments. The document suggests for small-scale sites, where the risks are low, to implement the “simple index approach” which provides a high-level scoping analysis of the land usage and gives guidelines for appropriate treatment stages.
- 5.3 The “Simple Index Approach” is a process which identifies features necessary to provide adequate substance removal in line with Environment Agency requirements. This is a three-step process of Allocation, Mitigation and Review.
- 5.4 Surfaces generating runoff are ‘graded’ on their potential to contribute to various harmful pollutants and give each surface a risk of pollution from each element. An extract of Table 26.2 within the SuDS Manual is set out below in Table 1. This table highlights the land usages present within the proposals.

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- 5.5 Any runoff generated from the site access road is being conveyed through traditional drainage methods to the existing site-wide drainage infrastructure and so is not being taken into account within the below calculations.

Table 1: Land Use Classification

Land Use	Pollution Level	Total suspended Solids	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other roofs	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Low-traffic residential roads and non-residential parking with infrequent change.	Low	0.5	0.4	0.4
Commercial yard, parking with frequent change, other roads.	Medium	0.7	0.6	0.7
Sites with heavy pollution	High	0.8 ²	0.8 ²	0.9 ²

- 5.6 The respective cleansing abilities of common SuDS features are given by corresponding mitigation indices within the SuDS Manual. An extract of Table 26.4 is set out below in *Table 2*.

Table 2: Indicative SuDS mitigation indices for discharge to groundwater extract.

Characteristics of the material overlaying the proposed infiltration surface, through which the runoff percolates.	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.3	0.3
Infiltration trench underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.4	0.4
Constructed permeable paving underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7

- 5.7 The individual pollution indices are totalled, with the first SuDS component utilising its full value and subsequent downstream SuDS features acting with 50% efficiency. This provides a realistic strategy which mimics the reduced cleansing effectiveness as the concentration of a pollutant decreases along the SuDS train.

Table 3: Proposed SuDS Cleansing Abilities

Use	Pollution Hazard Index			SUDS Component	Mitigation Index		
	TSS	Metals	Hydrocarbons		TSS	Metals	Hydrocarbons
Residential Roofs	0.2	0.2	0.05	Infiltration Basin with 300mm of soil with a good contaminant attenuation potential	0.4	0.3	0.3
Low-traffic residential roads	0.5	0.4	0.	Constructed permeable paving underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7

- 5.8 Table 3 above shows that the proposed Infiltration Basin and Permeable Paving meet the cleansing requirements.
- 5.9 In line with Environment Agency guidance, before the design phase is concluded, the proposals will be reviewed and analysed to identify any potential shortcomings and to ensure that an adequate volume of SuDS features are provided to mitigate the risk of pollution from each source.

6. CONCLUSION

- 6.1 There are no known historical records of flooding at the site. The site falls within Flood Zone 1, making the development compliant with both national and local flood risk planning policies.
- 6.2 In the current development plan, surface water runoff will be effectively managed on-site, with roofs and private driveways/parking utilizing infiltration basins and permeable paving. Only the adoptable highway areas will connect to the sewer system located in Rogers Way.
- 6.3 Additionally, foul water from the site will discharge into the strategic foul sewer situated at Roger Way. As a result, it is reasonable to conclude that the proposed development can proceed without increasing flood risk in the surrounding areas and as there are no major changes on proposed development, the FRA carried out by CEC is still valid.

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