

SuDSmart Plus



Sustainable Drainage Assessment

Site Address

Land to the east of New Road
Melksham
SN12 7QZ

Grid Reference

392265, 165150

Report Prepared for

Local Authority Solutions Ltd
T/A Mark Doodes Planning
Unit 1, The Old Barn
Wicklesham Lodge Park
Faringdon
Oxfordshire
SN7 7PN

Date

12-12-2025

Report Status

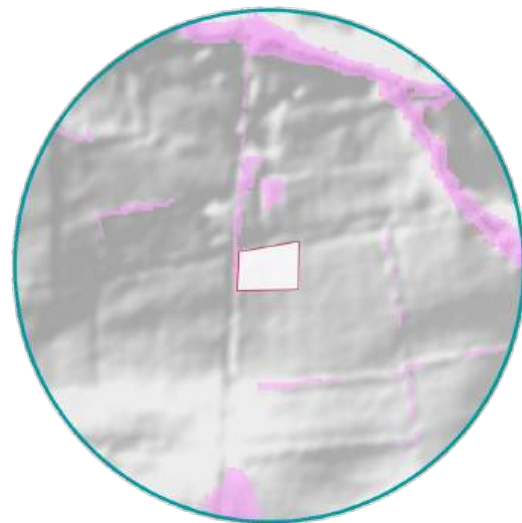
FINAL

Site Area

4000 m²

Report Reference

87667R1



Infiltrate to Ground

The proposed Sustainable Drainage Scheme (SuDS) strategy is comprised of rainwater harvesting and unlined permeable paving to attenuate surface water runoff during the 1 in 100 plus 45% climate change event.

Surface water will infiltrate via the ground, subject to confirmation of the infiltration rate at the Site, depth to groundwater and the incorporation of SuDS.

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1 Executive summary



This report assesses the feasibility of a range of Sustainable Drainage Scheme (SuDS) options in support of the Site development process. A SuDS strategy is proposed to ensure surface water runoff can be managed effectively over the lifetime of the development.

SuDS suitability

Risk	Issue	Result
Runoff destination feasibility	Priority 1: rainwater collected for non-potable use	Yes
	Priority 2: infiltration to ground	Low to Moderate
	Priority 3: discharge to an above ground surface water body	Low
	Priority 4: discharge to surface water sewer	Low
	Priority 5: discharge to combined sewer	Low
Flooding	What is the river (fluvial) and/or tidal flood risk at the Site?	Very Low
	What is the surface water (pluvial) flood risk at the Site?	Very Low to High
	What is the groundwater flood risk at the Site?	Negligible
Pollution	Is the groundwater a protected resource?	N/A
	Is the surface water feature a protected resource?	No

Summary of existing and proposed development

The Site currently comprises an undeveloped field bordered by trees. Development proposals comprise the construction of two new residential dwellings, each with an associated garage, private garden, rear patio and car parking, as well as a shared driveway.

As development plans have not been finalised, with several layouts currently being considered, the development layout with the largest impermeable area has been used for the SuDS calculations alongside a 20% freeboard allowance to account for a worst-case scenario.

National Standard 1: Runoff Destinations

Priority 1: collection for non-potable use

In line with DEFRA's national guidance, the potential for the collection of rainwater for non-potable use across the proposed development has been considered.

Rainwater harvesting butts are proposed at the base of the downpipes of the development in order to provide rainwater re-use potential at the Site, as well as to provide biodiversity and amenity benefits. Captured water will be used to water vegetation and ensure their long-term viability as sustainable amenity features. Due to the limited storage capacity and requirement to retain captured rainwater for non-potable use, the volume of runoff which could be attenuated has not been considered within the report.

Priority 2: infiltration to ground

GeoSmart's SuDS Infiltration Potential (SD50) map indicates that the Site has a Low to Moderate potential for infiltration, primarily due to the anticipated variable permeability of the underlying geology (silt and clay). Infiltration to ground therefore could be feasible and is proposed in the absence of any other options.

A site investigation comprising trial pits is recommended to confirm the depth to groundwater and allow infiltration tests to be undertaken to confirm the feasibility of an infiltration SuDS scheme.

Priority 3: discharge to above ground surface water body

Ordnance Survey (OS) mapping indicates that a surface water feature (a pond) is located c. 80 m to the north of the Site. Discharging surface water runoff to this feature would require drainage pipework to cross third-party rural land and therefore should not be considered.

Priority 4: discharge to surface water sewer

The asset location plan included in Appendix C confirms that there are no public surface water sewers within the vicinity of the Site that could feasibly be discharged to. As such, discharge to surface water sewer is not considered to be feasible.

Priority 5: discharge to combined sewer

The asset location plan included in Appendix C confirms that there are no public combined sewers within the vicinity of the Site that could feasibly be discharged to. As such, discharge to combined sewer is not considered to be feasible.

Runoff rate and attenuation requirements

Discharging via infiltration requires 63.60 m³ of attenuation to be provided to ensure there is no flooding as a result of the development in all storm events up to and including the 1 in 100 year including a 45% allowance for climate change and 10% allowance for urban creep. This volume has been calculated using Causeway Flow v.14.0 based on an assumed infiltration rate of 1 x 10⁻⁵ m/s taken from Table 25.1 of the CIRIA SuDS (C753) (2015) as the

worst case scenario for 'slightly silty slightly clayey sand' soil type. This is subject to the results of infiltration testing and would ensure runoff is not increased above the greenfield scenario.

Proposed SuDS strategy

SuDS features comprised of rainwater harvesting and permeable paving are proposed to attenuate a minimum of 49.31 m³ of surface water runoff. The SuDS features would provide some water quality benefits (interception and filtration) prior to infiltrating to ground. Lining should be added to the permeable paving where it is adjacent to or within 5m of the buildings foundations.

The proposed SuDS strategy would ensure surface water runoff is stored on-Site in SuDS features for the 1 in 100 year event including a 45% allowance for climate change and will not cause flooding to the proposed development in accordance with DEFRA's national standards for SuDS (2025).

Amenity and biodiversity

The inclusion of SuDS planters at the downpipes where feasible would provide sufficient biodiversity and amenity benefits to the areas of proposed development, keeping surface water at/or close to ground level to provide health and wellbeing benefits for any on-site users. Captured water will be used to water vegetation and ensure their long-term viability as amenity features.

SuDS & drainage network maintenance

The management and maintenance of the SuDS features, in line with the details and schedules outlined in Section 10 of this report, will be undertaken by contractors appointed by the owners and occupiers of the new residential buildings.

Recommendations / Next steps

A site investigation is required to confirm the infiltration capacity of the ground in line with BRE 365 guidelines to confirm the infiltration rate and the groundwater level.

2 Proposed SuDS strategy



The most suitable SuDS options are outlined below and a SuDS strategy schematic is shown overleaf. Supporting information is provided in subsequent sections.

Table 1. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting and unlined permeable paving.
Discharge location	Infiltration.
Discharge rate	1×10^{-5} m/s*

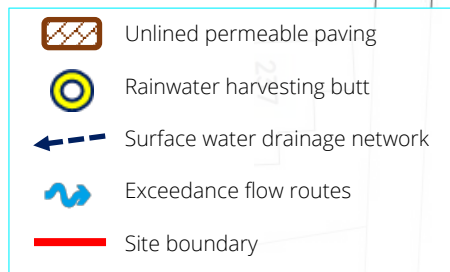
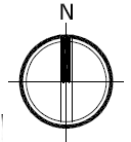
*Based upon an assumed infiltration rate of 1×10^{-5} m/s, the worst-case infiltration rate for 'slightly silty, slightly clayey sand' soil types, taken from Table 25.1 of the CIRIA SuDS manual (C753) (2015) - to be confirmed via infiltration testing.

Table 2. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater harvesting	To comply with DEFRA's national standards for SuDS (2025), rainwater harvesting butts should be established for each proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the preliminary SuDS strategy.
Permeable paving	A 530 m ² area of unlined permeable paving (underlain with a Type 3 aggregate material with a 30% porosity) within the proposed driveway areas to a depth of 0.40 m would provide c. 63.60 m ³ of attenuation. Lining should be added to the permeable paving where it is adjacent to or within 5m of the buildings foundations.
Total attenuation provided	63.60 m ³
Total attenuation required	49.31 m ³
Freeboard storage provided	14.29 m ³

Figure 1. SuDS strategy schematic

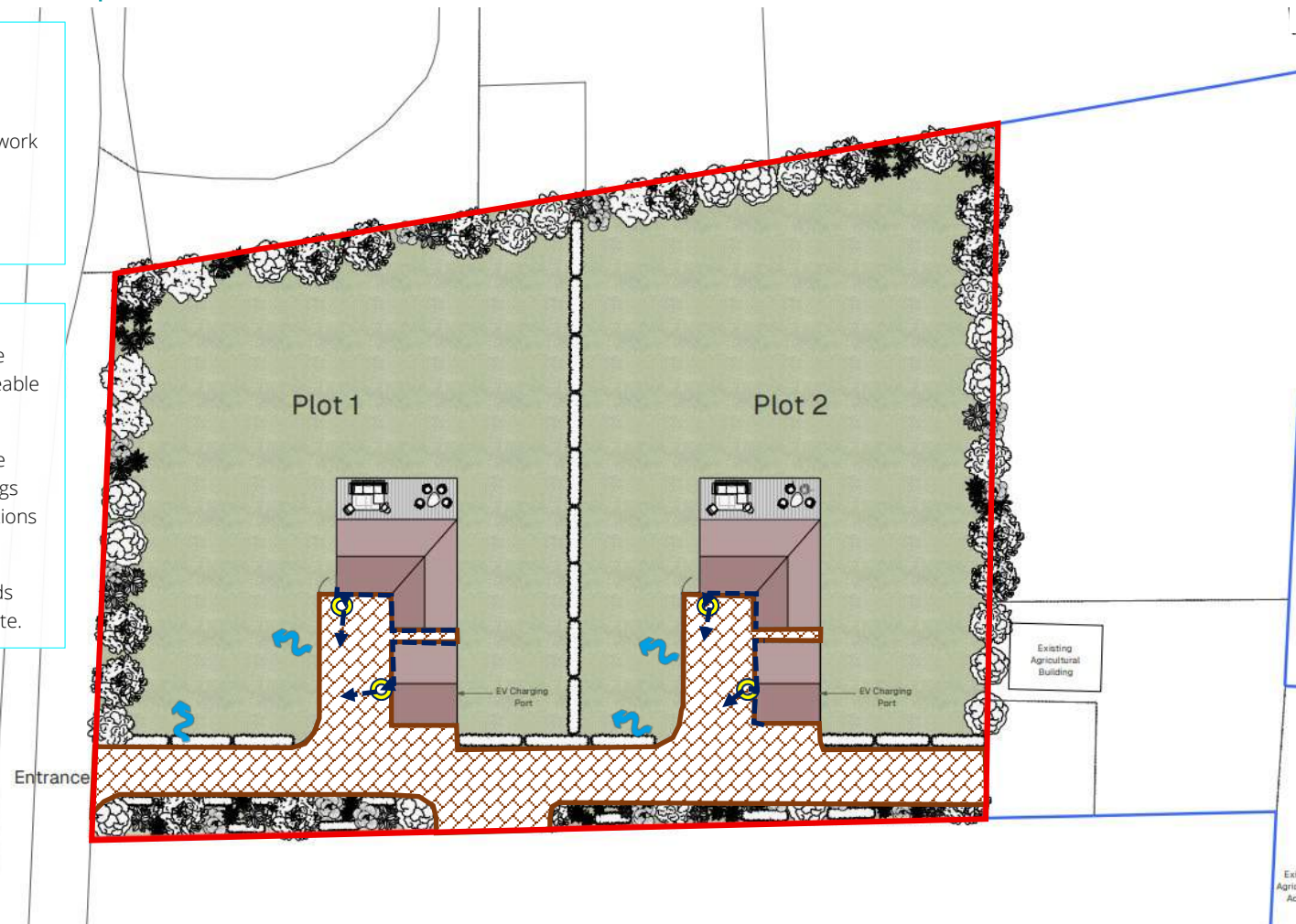
Figure 1. Proposed SuDS scheme



Surface water from the proposed dwellings should be conveyed into the rainwater harvesting butts and permeable paving for discharge to the ground.

It should be noted that the permeable paving located adjacent to the buildings and within 5m of the building foundations should be lined.

Exceedance flows are directed towards non-essential, landscaped areas on Site.



Schematic is not to scale

3 National & local policy context



National Guidance

DEFRA - National standards for sustainable drainage systems (SuDS) (2025)

Standard 1: runoff destinations

A 'SuDS approach' shall be adopted to address the management of surface water by the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology.

Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

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

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority final destinations.

Where more than one final destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.

Standard 2: management of everyday rainfall (interception)

Apply a 'SuDS approach' so that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems.

Evidence shall be provided that the approach to managing runoff from 'everyday' rainfall has been developed alongside and in support of the management of runoff quality (standard 4) and the delivery of amenity and biodiversity benefits (standards 5 and 6).

Standard 3: management of extreme rainfall and flooding

A 'SuDS approach' shall be adopted to address the management of development runoff during extreme rainfall, including allowances for climate change and urban creep to:

- protect people and property on the development from flooding of the surface water drainage system
- mitigate any increased flood risk to people and property adjacent to or downstream of the development
- protect the receiving water body from morphological damage or minimise the impact on sewer capacity

When discharging to an infiltration feature, the system shall be appropriately sized to accommodate the design event based on ground conditions and contributing areas.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff (rate and volume) for the 1% annual exceedance probability (AEP) event shall be controlled to ensure the runoff from the development does not increase flood risk elsewhere.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff rate for the 50% AEP event shall be controlled to ensure development runoff from an event of this magnitude has no negative impact.

Any flooding from the surface water drainage system for events up to the 1% AEP event shall be managed within the development.

Any flooding from off-site sources for the 1% AEP event should be managed on site or safely routed through the site, ensuring any downstream risks are not increased compared to the pre-development scenario.

The risks (both on and off the development) associated with flooding from the surface water drainage system for exceedance events greater than the 1% AEP event shall be appropriately managed.

Standard 4: water quality

Apply a 'SuDS approach' that protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development.

The proposed SuDS management train(s) shall be based on a robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters, reflecting industry recognised guidance or other quantitative assessment as agreed with the approving body and permitting requirements.

Standard 5: amenity

A 'SuDS approach' shall be adopted that maximises benefits for amenity through the creation of multi-functional places and landscapes.

Standard 6: biodiversity

A 'SuDS approach' shall be adopted to ensure the surface water drainage system maximises biodiversity benefits throughout the development lifecycle.

The surface water drainage system shall add biodiversity value by:

- creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity
- supporting and promoting natural local habitat and species, for example, through local nature recovery strategies (LNRS)
- contributing to the delivery of local biodiversity strategies
- contributing to habitat connectivity

Standard 7: design of drainage for construction, operation, maintenance, decommissioning and structural integrity

A 'SuDS approach' shall be adopted to ensure that surface water drainage systems are designed so they can be easily and safely constructed, operated and maintained taking account of the need to minimise negative impacts on natural resources and the environment.

The designer shall provide a management and maintenance plan that supports the design objectives detailed in standards 1 to 6 and ensures the performance of the surface water drainage system with regards to runoff destinations, everyday and extreme rainfall, water quality, amenity and biodiversity is maintained throughout the lifetime of the development.

Surface water drainage design shall examine for the likelihood and consequences of potential failure scenarios that may occur during the operation phase and safely manage the associated risks.

The surface water drainage system shall be designed to ensure structural integrity of all components under anticipated loading conditions for the design life of the development so that it does not affect the structural integrity of any existing or proposed components within, or adjacent to, the development.

Urban Creep

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%.

Ministry of Housing, Communities & Local Government – National Planning Practice Guidance: Flood risk assessments: climate change allowances (2025)

The Peak rainfall intensity allowances section provides advice on the increased rainfall effects on river levels and land and urban drainage systems. As of September 2025, the applicable climate change allowance is defined by specific Management Catchment for the 1 in 30 ($\geq 3.3\%$ AEP) and 1 in 100 (< 3.3 to 1% AEP) year event.

As the Site is located within the Avon Bristol and North Somerset Streams Management Catchment the following climate change allowances are applicable.

Table 3. Avon Bristol and North Somerset Streams Management Catchment peak rainfall allowances

Avon Bristol and North Somerset Streams Management Catchment	3.3% Annual exceedance rainfall event		1% Annual exceedance rainfall event	
	2050s	2070s	2050s	2070s
Central	20%	25%	25%	25%
Upper end	35%	40%	40%	45%

The drainage system should be designed to make sure there is no increase in the rate of runoff discharged from the Site for the upper end allowance.

Where on-Site flooding for the upper end allowance presents a significant flood hazard (for example, depths and velocities of surface water runoff cause a significant danger to people), you will need to take further mitigation measures to protect people and property (for example, raising finished floor levels). As a minimum, there should be no significant flood hazard to people from on-Site flooding for the central allowance.

Local Policy

Wiltshire Council – Wiltshire Core Strategy (January, 2015):

6.181 The Core Strategy supports a sustainable approach to surface water drainage, and development will be expected to incorporate Sustainable Drainage Systems (SuDS) such as rainwater harvesting, green roofs, permeable paving, and ponds, wetlands and swales, wherever possible. The provision of green infrastructure, including woodland, should also be considered as a measure to reduce surface water run-off. Prospective developers will be expected to follow the ‘surface water management train’ approach 308 recommended by the Environment Agency (see Sustainable Drainage Systems: an introduction, published by the Environment Agency). This involves a three-step process, considering first reducing the

quantity of run-off, then slowing velocity of runoff to allow settlement filtering and infiltration, and finally providing passive treatment to collected surface water before discharge into groundwater or to a watercourse. It is considered that all developments will be able to incorporate measures to reduce the quantity of run-off, but site specific geological or soil conditions may mean that measures to reduce run-off velocity and provide passive treatment would not be appropriate. Where this is the case, proposals will be expected to demonstrate why the use of such measures is not appropriate on the site in question.

6.182 In addition to the requirement for development to provide SuDS, any opportunities to reinstate or create additional natural, functional floodplain through the development process will be encouraged.

Core Policy 67 Flood Risk

Development proposed in Flood Zones 2 and 3 as identified within the Strategic Flood Risk Assessment will need to refer to the Strategic Housing Land Availability Assessment when providing evidence to the local planning authority in order to apply the sequential test in line with the requirements of national policy and established best practice.

All new development will include measures to reduce the rate of rainwater run-off and improve rainwater infiltration to soil and ground (sustainable urban drainage) unless site or environmental conditions make these measures unsuitable.

*Wiltshire Council - Wiltshire Local Plan Pre-Submission Draft 2020-2038
(Regulation 19) (September 2023):*

Policy 95 Flood risk

The council will follow a sequential approach to flood risk management, in line with national policy and guidance. All development proposals will be required to consider the effect of the proposed development on flood risk from all sources, both on and offsite, commensurate with the scale and impact of the development.

Where required, a Site-Specific Flood Risk Assessment, Surface Water Drainage Strategy and Groundwater Assessment should be conducted. This must take account of all flood risk sources and cumulative effects and should incorporate suitable flood risk measures to account for site conditions.

All new development, including where appropriate retrofitting proposals, will include measures to reduce the rate of rainwater run-off and incorporate sustainable drainage systems (SuDS). All major development should achieve a 20% betterment on greenfield runoff rates whereby runoff is managed as close to the source as possible, in line with the surface water discharge hierarchy:

- rainwater re-use (rainwater harvesting/greywater recycling)
- an adequate soakaway or other infiltration system (viability testing required)
- hybrid solution of infiltration and discharging to a surface water body
- to a surface water body (e.g., an ordinary watercourse)

- to a surface water sewer, highway drain, or other drainage system (add justification for no discharge to highway)
- to a combined sewer

As part of drainage strategies, the council, in accordance with national policy guidance, will discourage culverting or the building over of watercourses wherever practicable. In addition, opportunities should be taken to secure the removal of existing culverting and the retention of all existing land drainage features.

The drainage strategy must ensure that flood risk is addressed to flood depths for a 1 in 100-year storm event plus climate change in line with Environment Agency guidance. The drainage strategy must demonstrate that development proposals will remain safe during a flood event throughout its lifetime and consider access, egress and emergency exit routes. The Drainage Strategy must recognise and demonstrate opportunities for SuDS to provide other multiple benefits.

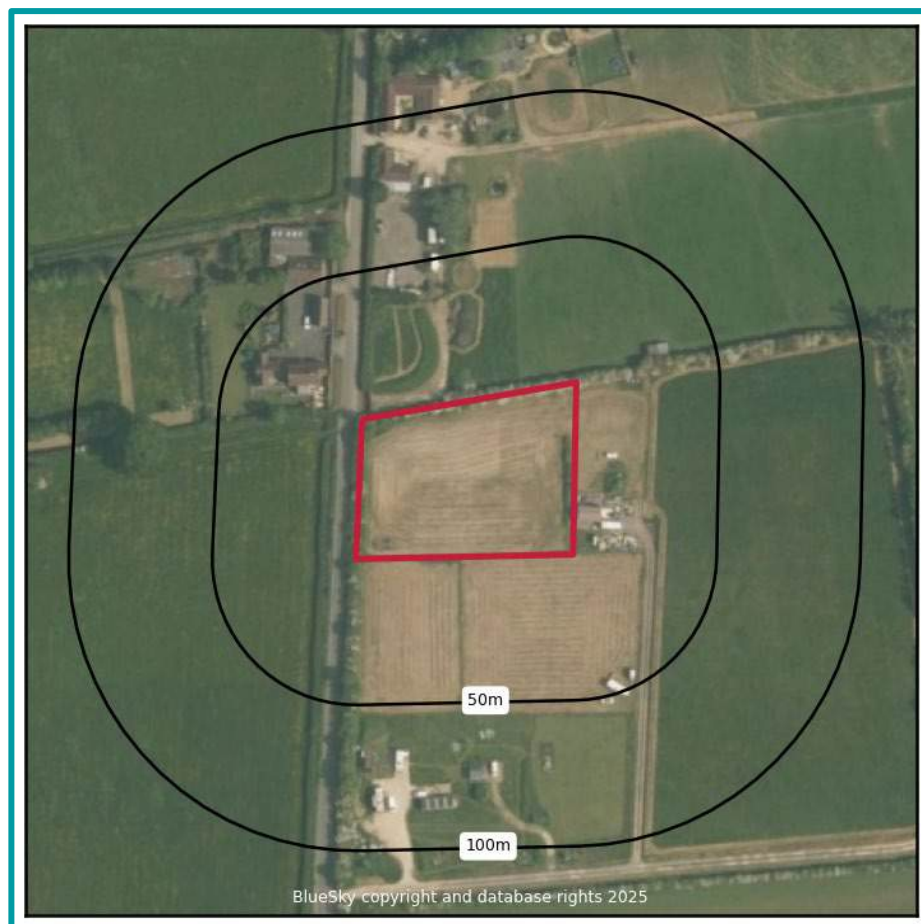
The drainage strategy should be informed by the council's Green and Blue Infrastructure Strategy, the Climate Change Adaptation Plan, and the Wiltshire Design Guide as these all provide guidance on SuDS by incorporating the synergistic benefits and a nature-based approach, dealing with runoff onsite where possible and avoiding methods such as culverting which alters the natural formation of watercourses.

4 Site analysis



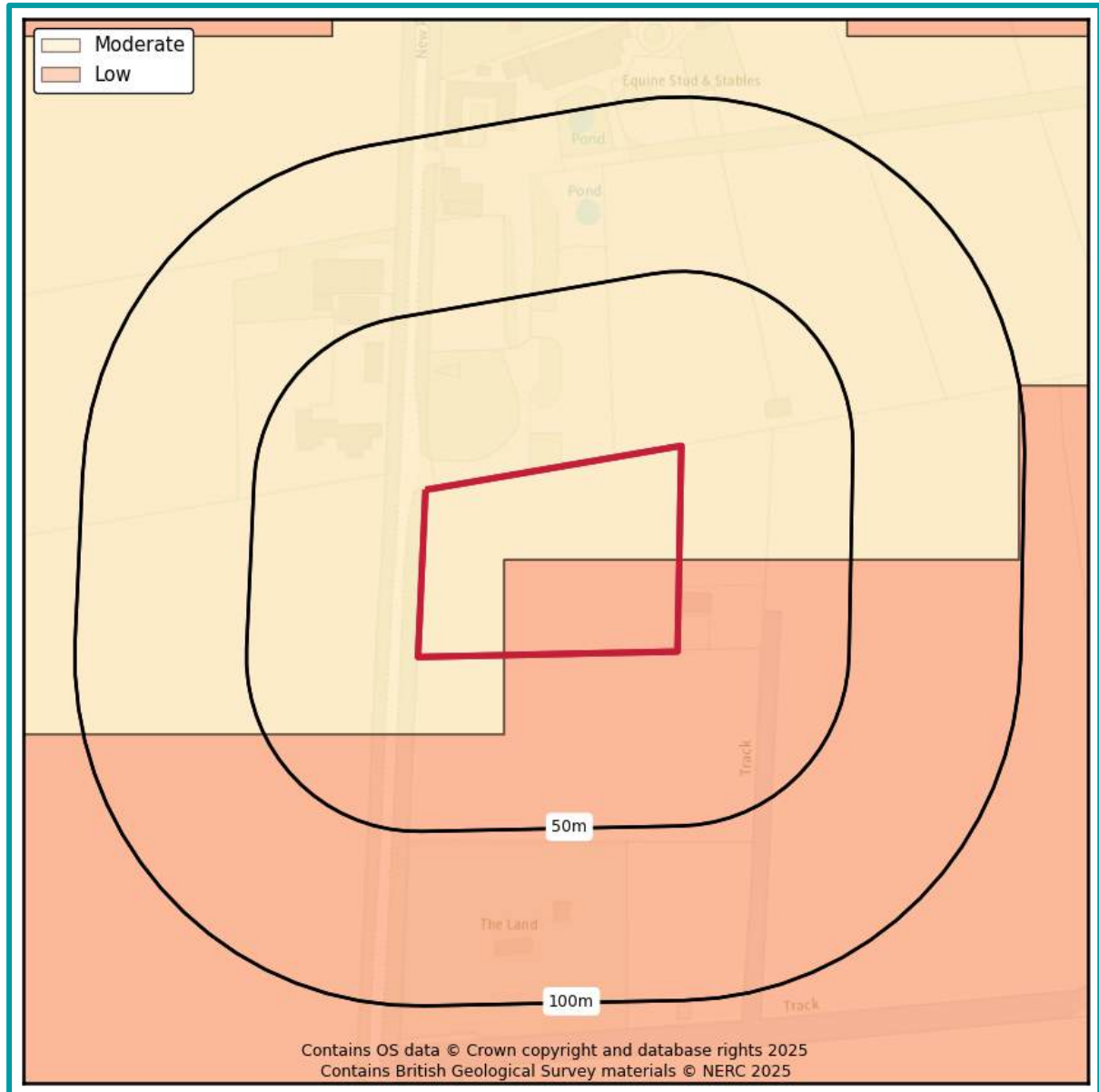
Site location

Figure 2. Aerial Imagery (Bluesky, 2025)



Infiltration suitability

Figure 3. SuDS infiltration suitability (SD50) map (GeoSmart, 2025)

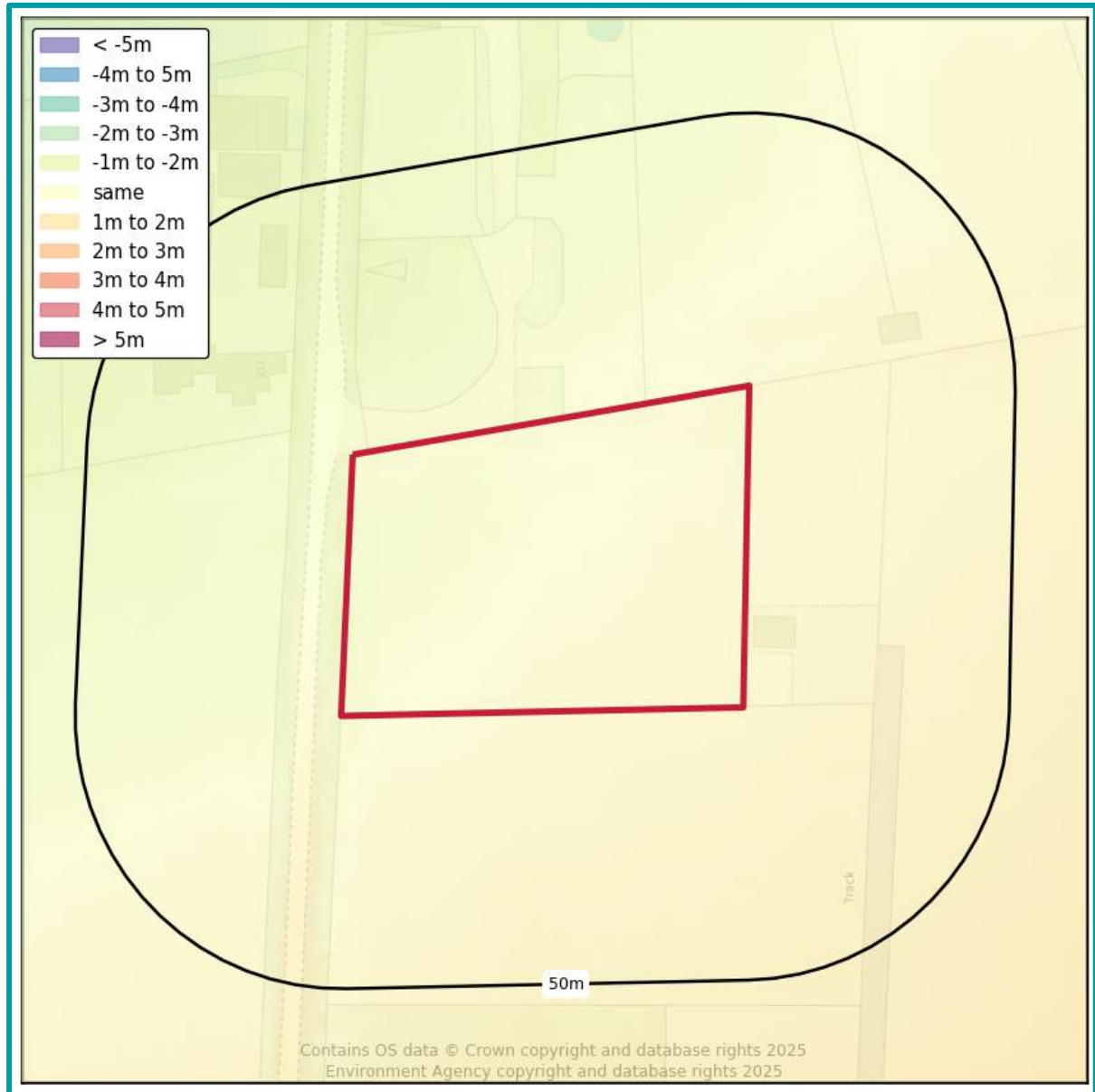


According to GeoSmart's SD50 mapping, there is a variable potential for infiltration SuDS across the Site ranging from Low to Moderate. It is likely that the underlying geology at the Site has variable permeability and an infiltration SuDS scheme could be possible at the Site.

Site Investigation is recommended to confirm the infiltration capacity and the depth to groundwater.

Topography

Figure 4. Site topography (GeoSmart, 2025)



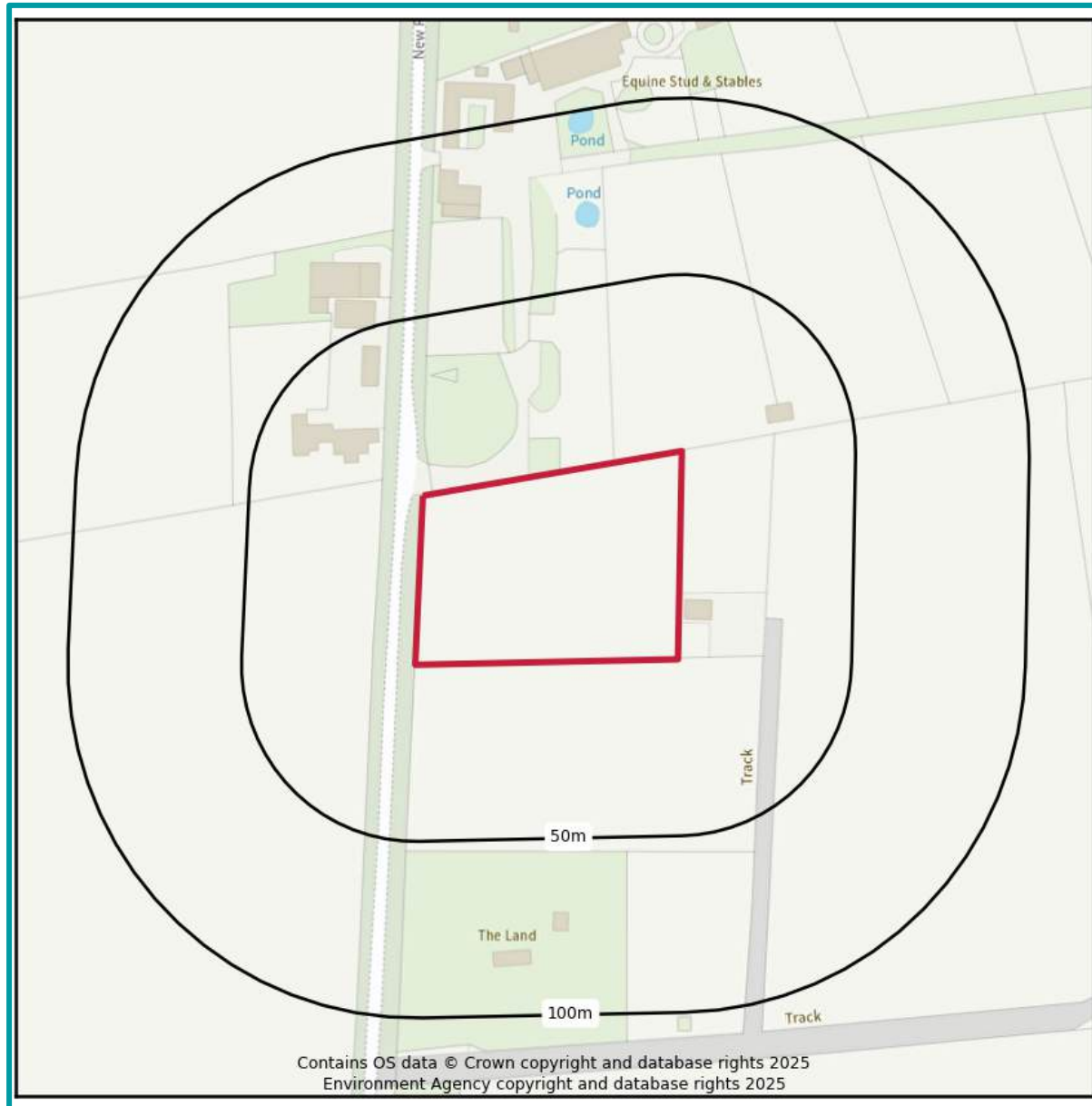
According to a review of the LiDAR DTM5 elevation data for the prevailing area, the ground levels within the vicinity of the Site typically fall to the north west.

The topography on-Site typically falls to the west, with ground levels ranging from 43.74 to 44.56 mAOD. This is based on EA elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ± 150 mm.

Further analysis could be undertaken by visiting the Site or by collecting additional topographic survey data to provide further confirmation of ground levels.

Land designations

Figure 5. Source protection zone map (EA, 2025)

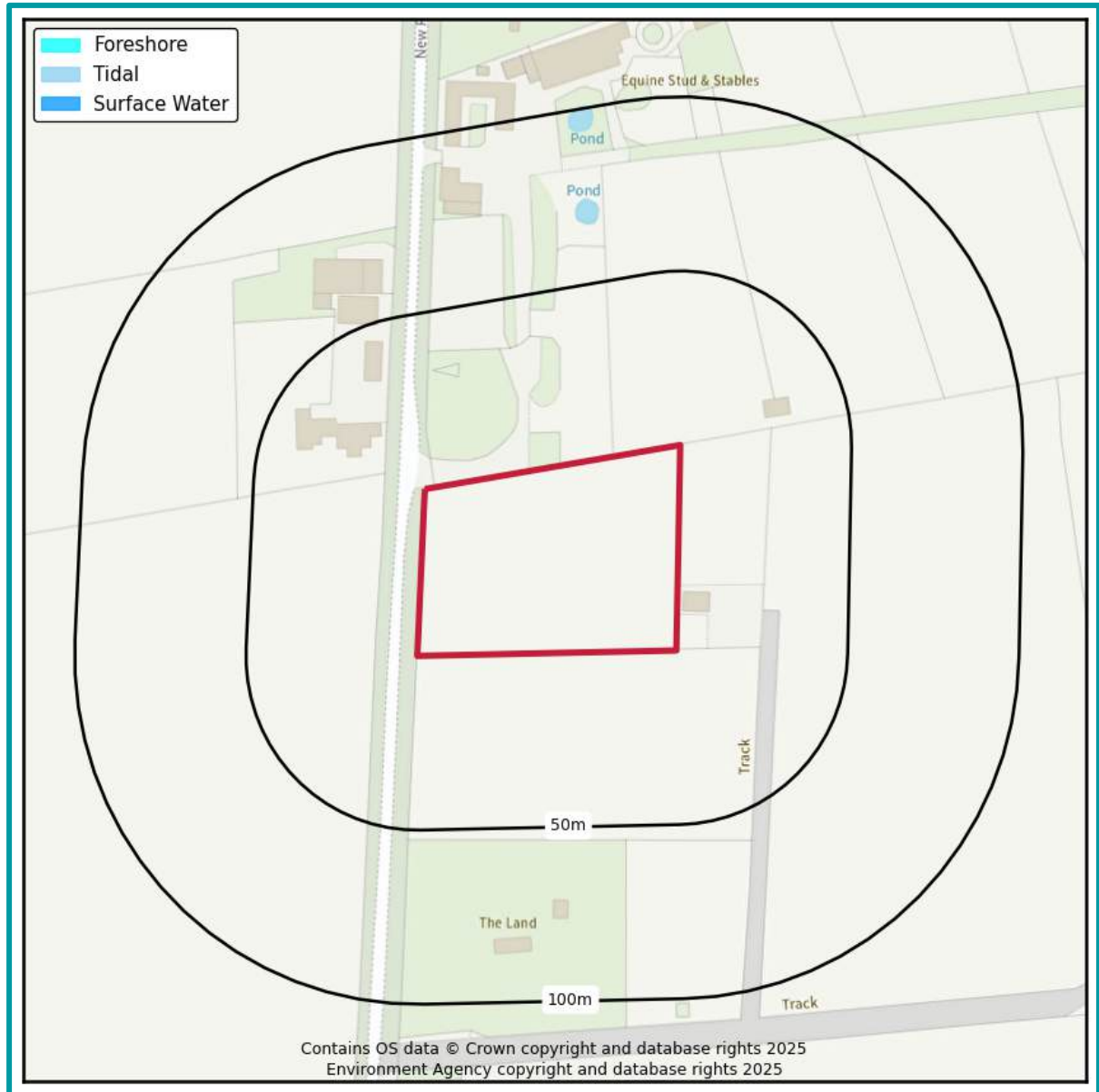


According to DEFRA's Magic Map, the Site is not located within a groundwater Source Protection Zone (SPZ). The mapping also confirms that the Site is not within 250m of a SSSI or SPA.

If further analysis is required, this would involve a review of Site specific contaminated land data. If hazards are identified, it is recommended that the Local Authority and the Environment Agency are contacted to confirm the susceptibility of any SPZs within the wider area.

Surface water features

Figure 6. Surface water features map (EA, 2025)



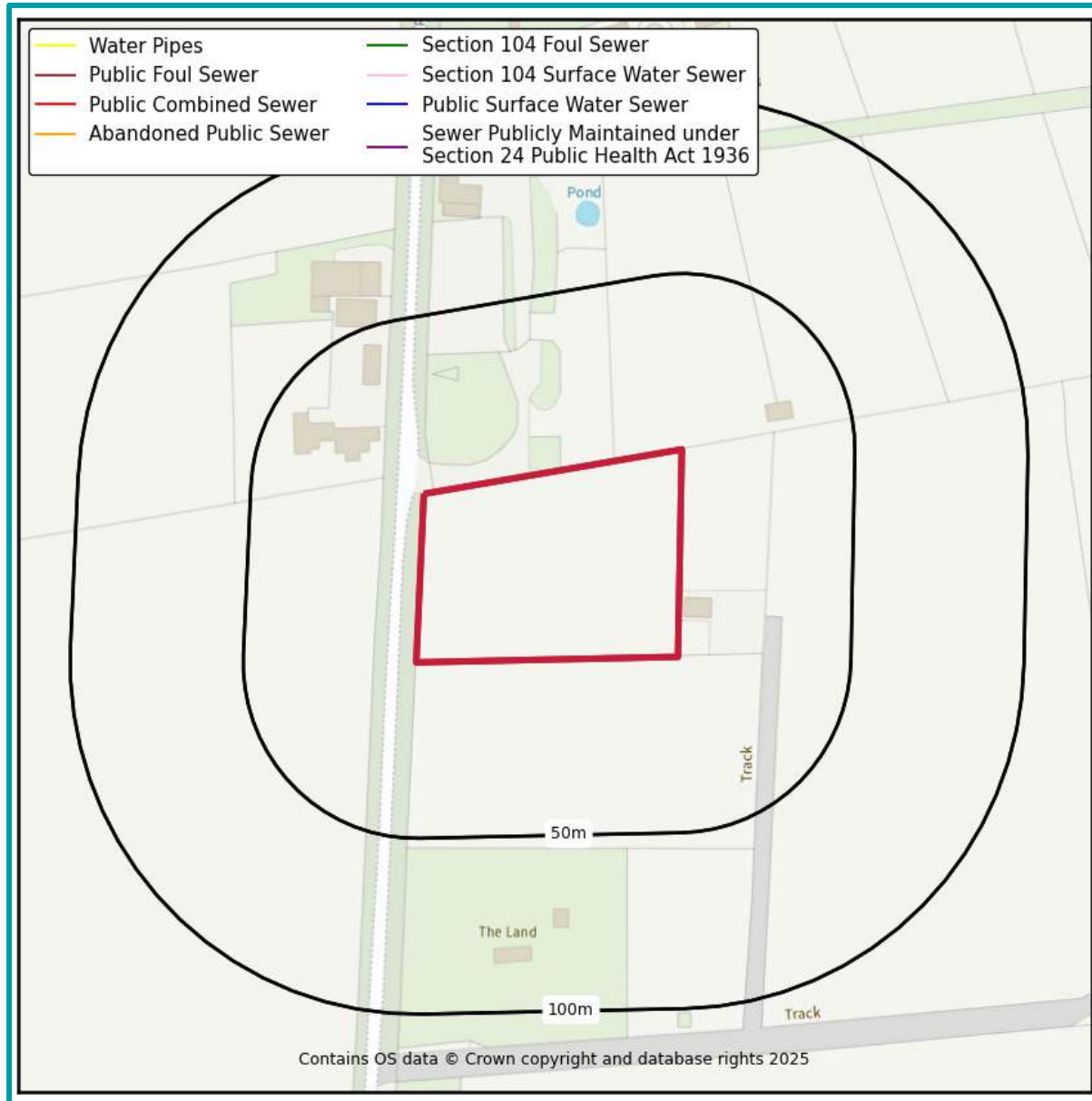
OS mapping indicates that a surface water feature (a pond) is located c.70 m north of the Site.

Discharging surface water runoff to this feature would require drainage pipework to cross a significant distance across third-party land. Additionally, it is not known whether the pond connects to any wider surface water features or drainage networks, and access to the pond is likely to be constrained. Therefore, it should not be considered as a potential discharge destination.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency (EA) to confirm the presence, location and condition of any mapped or potentially unmapped surface water features.

Sewer features

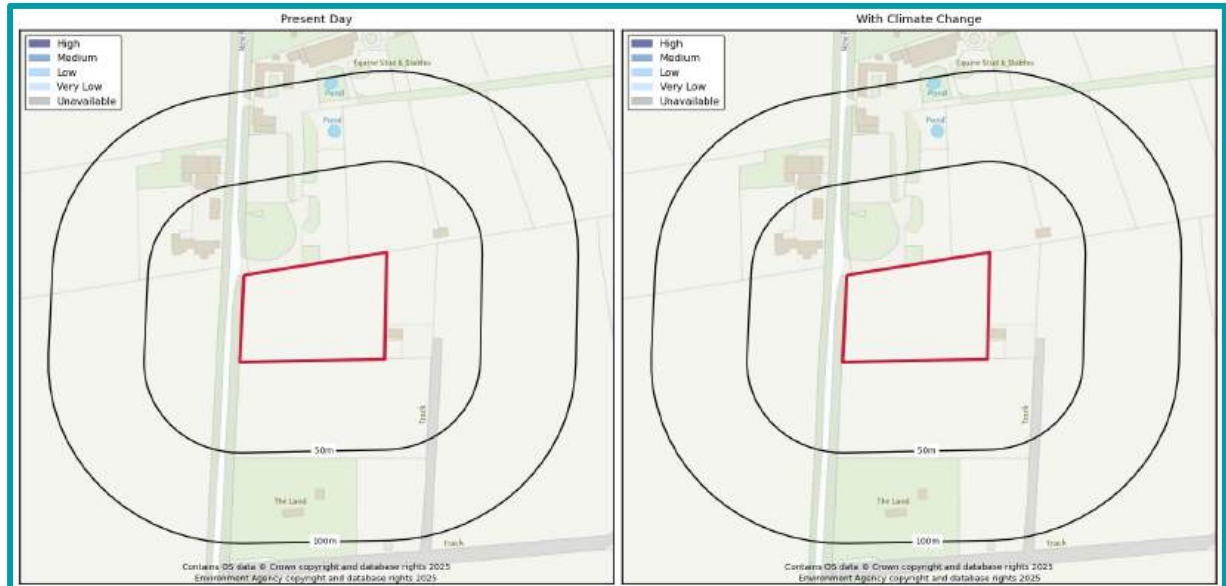
Figure 7. Sewer features map (OS & Wessex Water, 2025)



According to the Wessex Water asset location plan obtained for the Site (Appendix C), there are no public surface water sewer or combined sewers located within the vicinity of the Site. Therefore, discharging runoff to the public sewer network is unlikely to be feasible.

Flood risk

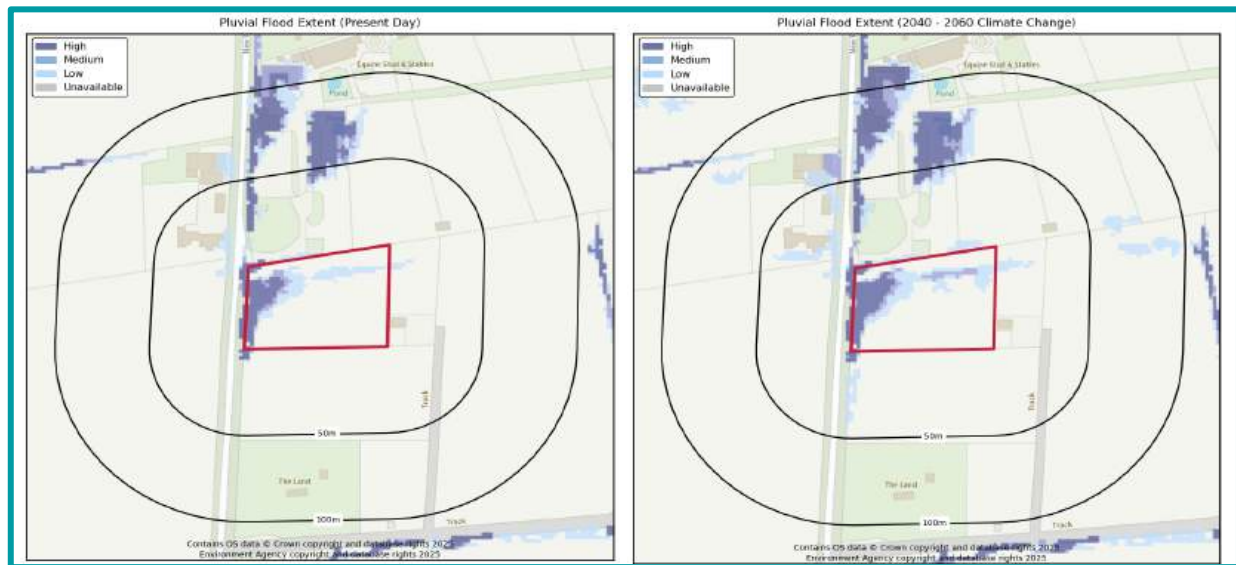
Figure 8. Risk of flooding from rivers & sea map (EA, 2025)



According to the EA's Risk of Flooding from Rivers and the Sea (RoFRS) map, the Site has a Very Low risk of flooding from fluvial or coastal flooding during both the present day and climate change (2036 to 2069) scenarios, with less than 0.1% annual probability of flooding. Therefore, the SuDS design is unlikely to be affected.

Further analysis could be undertaken by contacting the Local Council and the EA to confirm the risk and the associated flood depths.

Figure 9. Risk of surface water flooding map (EA, 2025)

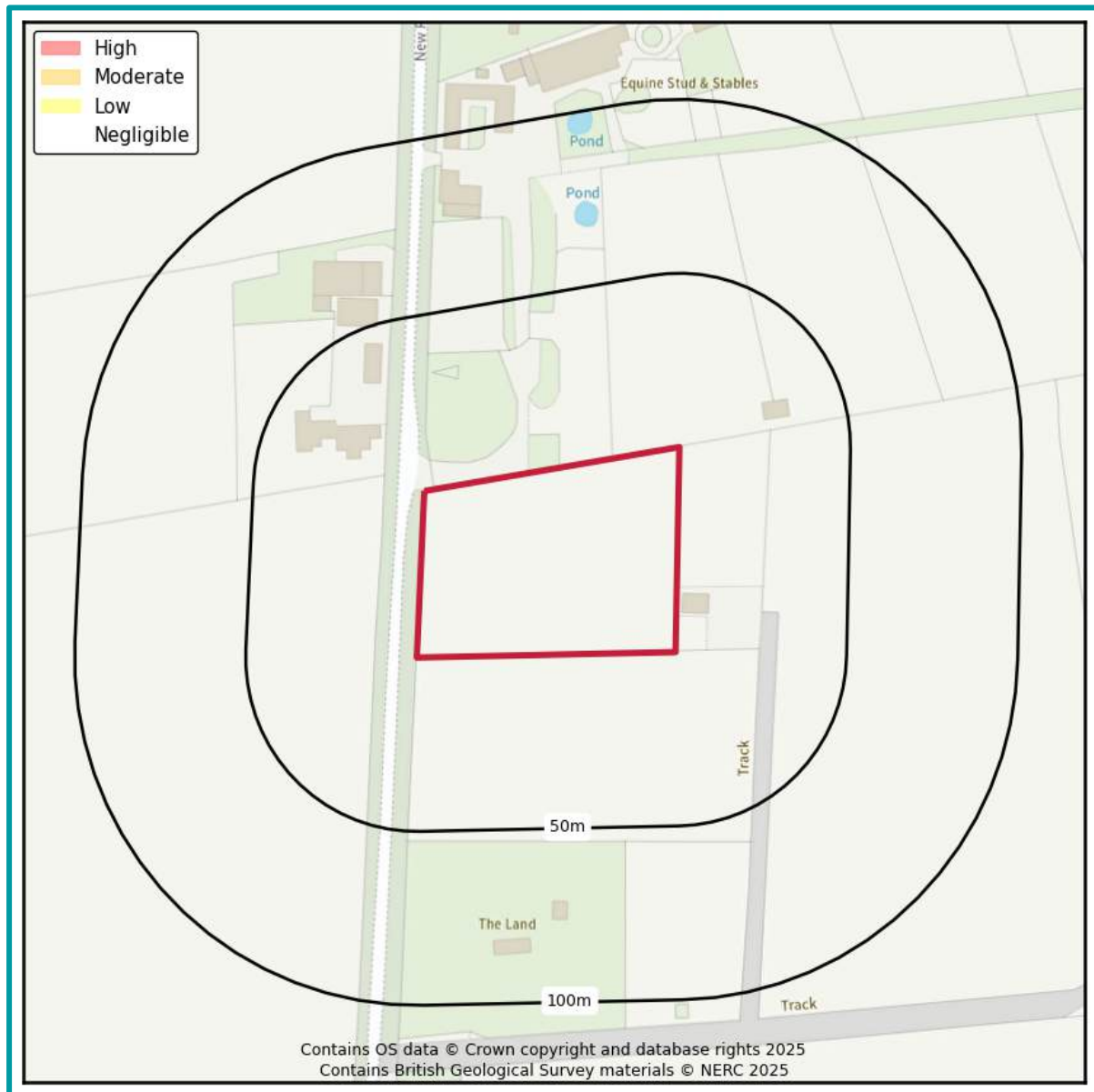


The EA's Risk of Flooding from Surface Water (RoFSW) mapping confirms the Site is considered to be at Very Low to High risk of surface water flooding during both the present day and climate change (2050s) scenarios.

The above map shows the extent of flooding during the >3.3% annual probability (AEP) (1 in 30 year – High risk), 3.3 – 1% AEP (1 in 100 year – Medium risk) and 1 – 0.1% AEP (1 in 1000 year – Low risk) events. This confirms there are areas where flooding could occur in the 1 in 30 year, 1 in 100 year and 1 in 1000 year events during the present day and climate change scenarios. Flooding in these areas may constrain certain types of SuDS features being used.

Further analysis could be undertaken by contacting the Local Council and the Environment Agency to confirm the pluvial flood risk, flood depths and velocities where applicable.

Figure 10. Groundwater flood risk (GW5) map (GeoSmart, 2025)



GeoSmart's Groundwater Flood Risk Screening (GW5) map confirms the Site has a Negligible risk of groundwater flooding during a 1% annual probability (1 in 100 year) event.

5 Site context



Site information

The purpose of this report is to assess the potential for disposing of surface water through a Sustainable Drainage System (SuDS) for the site of Land to the east of New Road, Melksham, SN12 7QZ ('the Site'). The Site is located within a setting of predominantly mixed rural and residential land use.

Development

The Site currently comprises an undeveloped field bordered by trees.

Development proposals comprise the construction of two new residential dwellings, each with an associated garage, private garden, rear patio and car parking, as well as a shared driveway.

As development plans have not been finalised, with several layouts currently being considered, the development layout with the largest impermeable area has been used for the SuDS calculations alongside a 20% freeboard allowance to account for a worst-case scenario. Site plans and drawings are provided in Appendix A.

Geology, permeability, and thickness

British Geological Survey (BGS) national superficial and bedrock geology mapping confirms the geological formations underlying the Site; each formation may have a range of permeabilities.

Table 4. Site Geology

Geology present on-Site		Likely to be permeable?
Superficial geology (Figure 11)	Head (HEAD) – clay and silt (northern c. 45% of the Site)	✓
	No underlying superficial geology (remaining c. 55% of the Site)	N/A
Bedrock geology (Figure 12)	Oxford Clay Formation (OXC) - mudstone	X

A review of the BGS borehole database (BGS, 2025) indicates that there are no relevant boreholes within the vicinity of the Site from which the mapped geology can be confirmed.

Figure 11. Superficial Geology (BGS, 2025)

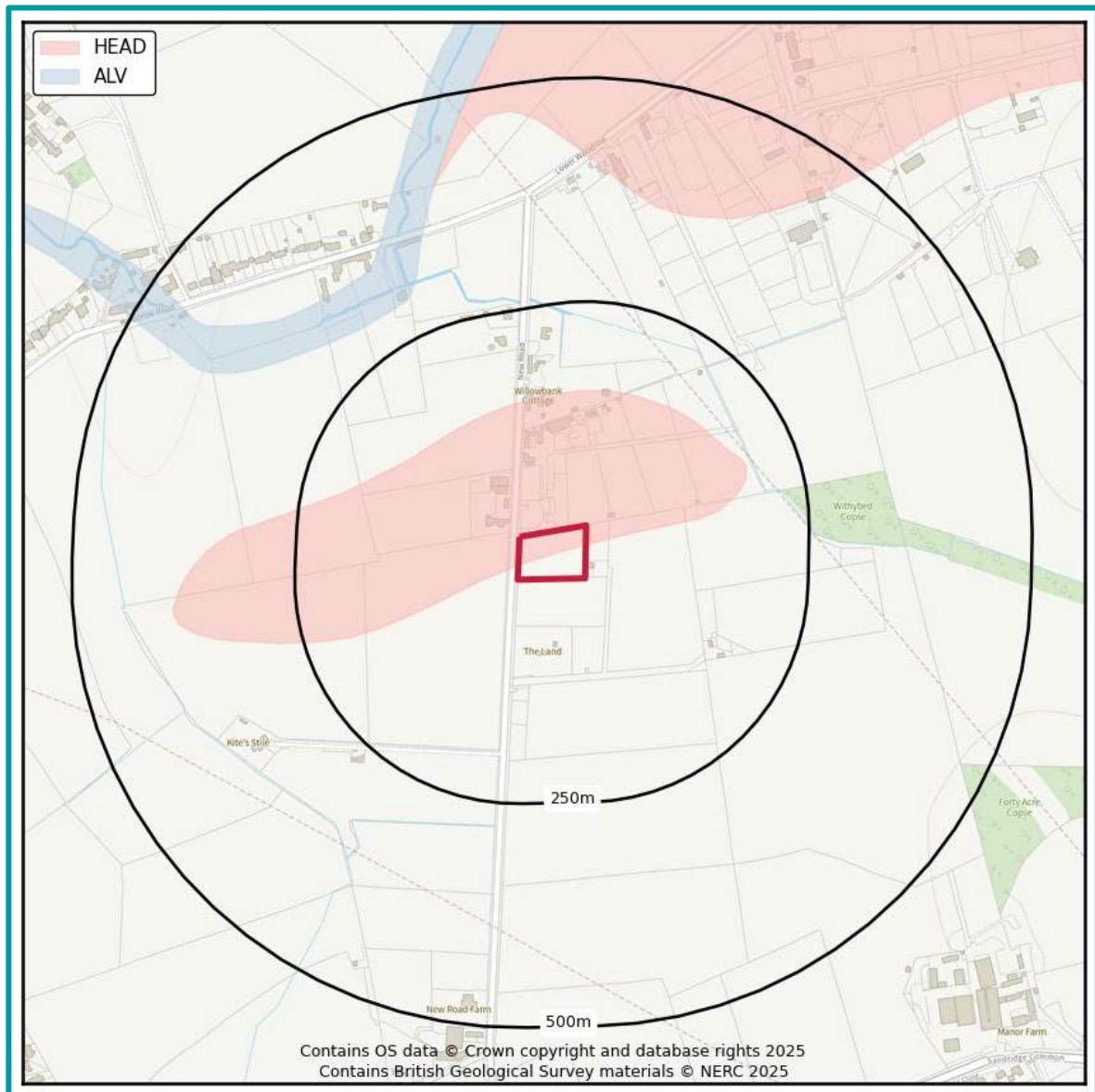
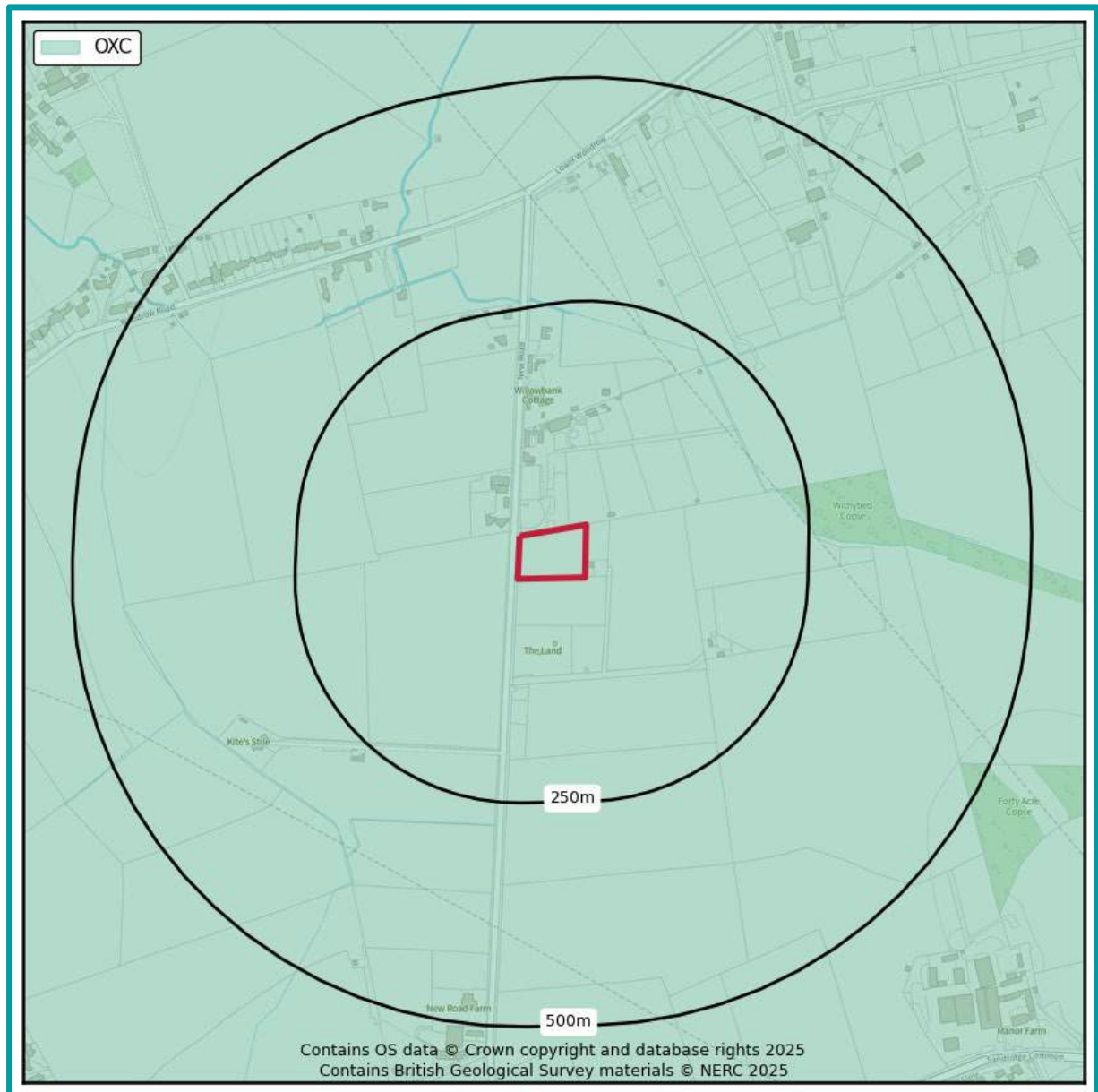


Figure 12. Bedrock Geology (BGS, 2025)



Depth to groundwater

The SuDS system should be designed to operate in periods of extreme groundwater levels.

No nearby BGS borehole records mapped within the same geological strata are available, and therefore the depth to groundwater at the Site cannot be confirmed.

According to GeoSmart's Groundwater Flood Risk (GW5) map, shallow groundwater is unlikely to be an issue at the Site.

The soil infiltration coefficient must be sufficient to accommodate the constraints on the dimensions of the soakaway and its emptying time.

Ground conditions

Infiltration SuDS are proposed within permeable superficial deposits above clay bedrock. A detailed review of underlying ground conditions is recommended to ensure focused infiltration does not result in the creation of shrink-swell clays.

Soakaways should be a minimum of 5m away from the foundations of a building and local guidance may recommend a greater distance, such as 10m on some areas of the Chalk.

Water quality

The Site does not lie within an SPZ. The infiltrated water quality should be of sufficient quality that it does not give rise to pollution of the underlying groundwater. Further consultation with the water company is unlikely to be required.

Infiltration systems should not be used where there is a risk of contaminating groundwater by infiltrating polluted runoff or where receiving groundwater is particularly sensitive.

The influence of surface runoff on water quality will depend on whether there is a source of contamination on-Site and the sensitivity of the receiving environment, either groundwater or surface water. The intervening pathway from source to receptor including mitigation and natural attenuation will determine the final impact.

The impact of contaminants on the groundwater will be reduced by travel and natural attenuation through the unsaturated soil zone. A greater depth of unsaturated zone and the presence of significant clay and organic material will provide greater protection for the underlying groundwater. Rapid flow through fractures will provide less protection than intergranular flow around soil and rock particles.

6 Runoff destination



National Standard 1: runoff destinations

Options for the destination for the runoff generated on-Site have been assessed in line with the prioritisation set out in DEFRA's national standards for sustainable drainage systems (2025).

Priority 1: Collection for non-potable use

An assessment of the potential for rainwater collection and re-use across the proposed development has been undertaken, which confirms that there is the potential for the provision of rainwater harvesting measures at the Site. Captured water could be used to water vegetation in order to provide additional amenity and biodiversity benefits.

Priority 2: Discharge to ground

There are no known issues identified relating to Site contamination or the presence of a SPZ.

According to GeoSmart's SD50 screening data, the Site has Low to Moderate potential for infiltration. Based on the available hydrogeological information (Section 5) the permeability of the underlying strata cannot be reliably quantified using the available geological information, and shallow groundwater is unlikely to be a concern at the Site.

In the absence of any other feasible discharge locations, a site investigation comprising trial pits is recommended to confirm the depth to groundwater and allow infiltration tests to be undertaken to confirm the feasibility of an infiltration SuDS scheme.

Priority 3: Discharge to above ground surface water body

According to OS mapping, a surface water feature (a pond) is located c. 80 m to the north of the Site boundary. Discharging surface water runoff to this feature would require drainage pipework to cross a significant distance across third-party, urbanised land; as such, discharge of runoff to this feature is not considered to be feasible.

Priority 4: Discharge to surface water sewer

According to the Wessex Water asset location plan obtained for the Site (Appendix C), there are no public surface water sewers within the vicinity of the Site. Therefore, discharge of runoff to surface water sewer is not considered to be feasible for the Site and is not proposed.

Priority 5: Discharge to combined sewer

According to the Wessex Water asset location plan obtained for the Site (Appendix C), there are no public combined sewers within the vicinity of the Site. Therefore, discharge of runoff to combined sewer is not considered to be feasible for the Site and is not proposed.

7 Storage, volume and peak flow rate



Urban creep

According to Paragraph 3.3 of the DEFRA National standards for SuDS, urban creep should be taken into account as part of the SuDS design. Urban creep accounts for the potential for impermeable areas to increase over the lifespan of a development, such as extensions to proposed building footprints and increases in patio areas.

Therefore, in accordance with the required allowance for a Site with external private permeable spaces, a 10% urban creep allowance has been applied to the proposed impermeable areas.

Surface water runoff

An increase in impermeable areas on-Site will result in greater rainfall runoff. A reduction in runoff will help mitigate flood risk both on and off-Site.

Table 5. Change in impermeable area associated with the development

Total Site area	4000 m ²
Impermeable area (and as a percentage of the total area of the proposed development footprint of 4000 m ²)	
Pre-development	Post-development
0 m ² (0%)	1106 m ² (28%) [‡]
Impermeable land use: N/A Permeable land use: 4000 m ² soft standing	New impermeable land use: 237 m ² building footprint, 71 m ² rear patios, 530 m ² paved areas New permeable land use: Landscaped areas

[‡] An additional 10% Urban Creep uplift factor has been applied to the post-development impermeable area in order to account for the potential for impermeable areas to increase over the lifespan of a development. Additionally, a further 20% increase in impermeable area has been applied as the proposed plans are subject to change and therefore this represents a worse-case scenario. The attenuation calculations should be refined to account for the proposed impermeable areas once the development layout has been finalised.

Suggested minimum and aspirational storage requirements for an infiltration SuDS scheme for the development footprint are set out below, with more detail provided in subsequent sections.

Table 6. Storage requirements for the proposed development (discharge of runoff via infiltration)

Attenuation scenario	Attenuation required (m ³)	Explanation
1 in 100 year including 45% CC	49.31*	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year event including a 45% allowance for climate change. Calculations are based on an assumed infiltration rate of 1×10^{-5} m/s (0.036 m/hr) (the worst-case infiltration rate for 'slightly silty, slightly clayey sand' soil types, taken from Table 25.1 of the CIRIA SuDS manual (C753) (2015) – to be confirmed via infiltration testing).

*Subject to confirmation through infiltration testing.

Peak discharge rates

The peak discharge rate is the maximum flow rate at which surface water runoff leaves the Site during a particular storm event, without considering the impact of any mitigation such as storage, infiltration or flow control. Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. If all runoff is disposed of via infiltration, there will be no discharge off-Site.

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate.

Table 7. Peak discharge rates associated with the development

Rainfall event	Greenfield runoff rates (l/s)	Existing runoff rates ¹ (l/s)	Potential runoff rates without attenuation (l/s)	Potential minus existing (l/s)
QBAR	2.17	N/A	N/A	N/A
6 hour 1 in 1 year	1.84	1.84	2.76	0.91
6 hour 1 in 10 year	3.23	3.23	4.47	1.24
6 hour 1 in 30 year	4.06	4.06	5.83	1.78
6 hour 1 in 100 year	5.25	5.25	7.56	2.31
6 hour 1 in 100 year + 20% CC	N/A	N/A	9.07	3.83
6 hour 1 in 100 year + 45% CC	N/A	N/A	10.97	5.72

¹ Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the loH124 method.

Relevant national, regional and local planning policy has been consulted in Section 3 to determine restrictions on runoff from previously developed and greenfield sites. In some cases, greenfield rates may be requested, but in practice it is difficult to restrict discharge rates at any one control point to less than 2 l/s, without increasing the risk of any potential blockages occurring in the drainage network.

Total discharge volumes

The table below presents discharge volumes for a range of storm events used to assess the impact of the proposed development and calculate the required storage volumes.

Table 8. Total discharge volumes associated with the development

Rainfall event	Greenfield runoff volume (m ³)	Existing runoff volume ² (m ³)	Potential runoff volume without attenuation (m ³)	Potential minus existing (m ³)
QBAR	48.24	N/A	N/A	N/A
6 hour 1 in 1 year	45.40	45.40	59.55	14.15
6 hour 1 in 10 year	74.92	74.92	96.63	21.71
6 hour 1 in 30 year	96.09	96.09	126.03	29.95
6 hour 1 in 100 year	124.53	124.53	163.34	38.81
6 hour 1 in 100 year + 20% CC	N/A	N/A	196.01	71.48
6 hour 1 in 100 year + 45% CC	N/A	N/A	236.85	112.32

² Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces, as calculated using the loH124 method.

8 Water quality



A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be effectively managed by an appropriate “train” or sequence of SuDS components that are connected in series. The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015). The proposed development is a combination of Very Low (roof water) to Low hazard (runoff from car parking and road). The Site does not lie within an SPZ and therefore additional treatment stages are not required.

Table 9. Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads and non-residential car parking within infrequent change (i.e. less than 300 traffic movements/day)	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other	High	0.8	0.8	0.9

than domestic fuel oil) are to be delivered, handled, storage, used or manufactured: industrial sites; trunk roads and motorways				
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Table 10. Indicative SuDS mitigation indices for discharges to groundwater

Characteristics of the material overlying 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 300 mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300 mm in depth	0.4	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, i.e. graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20 mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300 mm in depth	0.4	0.4	0.4
Constructed permeable pavement (where a suitable filtration layer is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential of at least 300 mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300 mm in depth	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

As indicated within Tables 9 and 10, the proposed permeable paving would provide sufficient mitigation indices to treat the Low pollution hazard associated with the Site use.

9 Proposed SuDS strategy



Sustainable drainage systems

DEFRA's national standards for SuDS require the below ground drainage systems to have the capacity to accommodate at least the 1 in 30 year event and to manage the 1 in 100 year event without flooding of on-site buildings and substations. All runoff should be managed on-Site though for the 1 in 100 year event, accounting for the maximum impacts of climate change to ensure flood risk is not increased to third-parties.

A surface water drainage strategy (summarised in Section 2 of this report) includes the following SuDS features to intercept, attenuate and treat surface water runoff.

SuDS Strategy:

Ground conditions at the Site are potentially conducive to infiltration. In the absence of any alternative feasible options, surface water runoff will be managed within SuDS features and infiltrated to ground.

Table 11. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting and unlined permeable paving.
Discharge location	Infiltration.
Discharge rate	$1 \times 10^{-5} \text{ m/s}^*$

*Based upon an assumed infiltration rate of $1 \times 10^{-5} \text{ m/s}$, the worst-case infiltration rate for 'slightly silty, slightly clayey sand' soil types, taken from Table 25.1 of the CIRIA SuDS manual (C753) (2015) - to be confirmed via infiltration testing.

Table 12. Proposed SuDS sizing (dimensions) and attenuation volumes

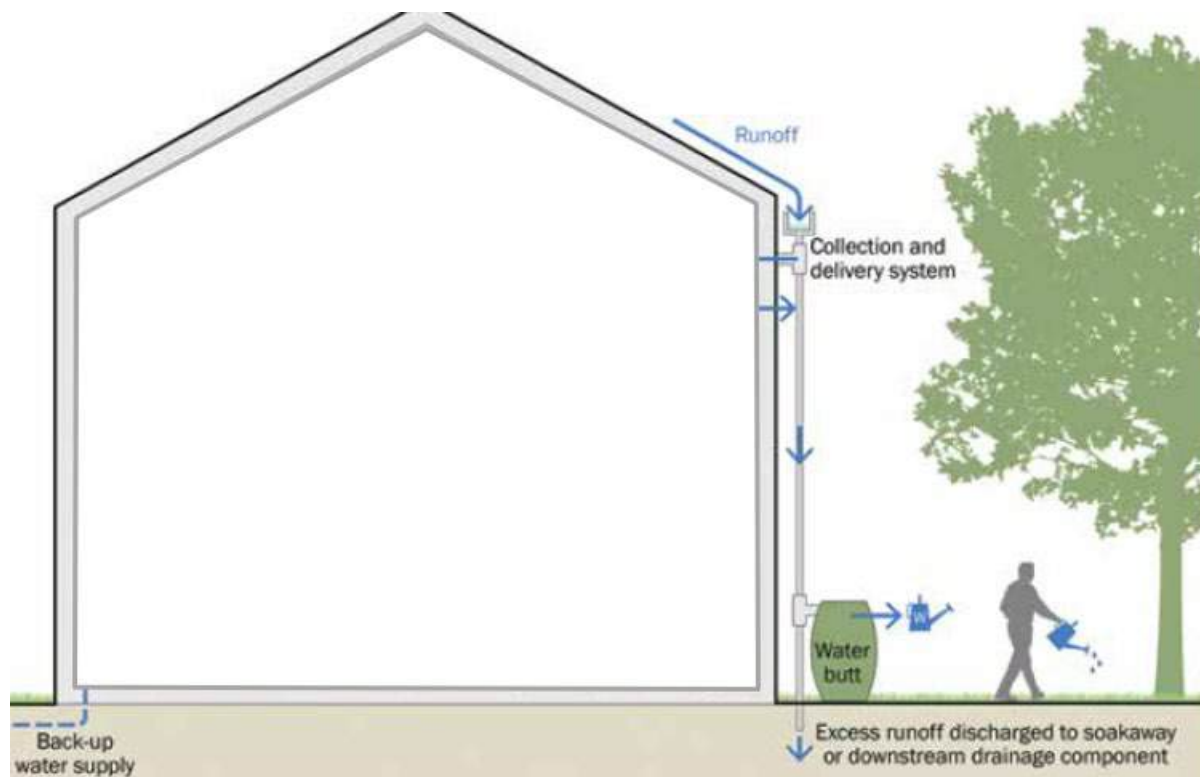
Rainwater harvesting	To comply with DEFRA's national standards for SuDS (2025), rainwater harvesting butts should be established for each proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the preliminary SuDS strategy.
Permeable paving	A 530 m^2 area of unlined permeable paving (underlain with a Type 3 aggregate material with a 30% porosity) within the proposed driveway areas to a depth of 0.40 m would provide c. 63.60 m^3 of attenuation.

	Lining should be added to the permeable paving where it is adjacent to or within 5m of the buildings foundations.
Total attenuation provided	63.60 m ³
Total attenuation required	49.31 m ³
Freeboard storage provided	14.29 m ³

Rainwater harvesting

Run-off from the proposed development roof should be led into rainwater harvesting butts via rainwater downpipes and guttering. Overflow from the butts should be discharged into the storage system provided by the permeable paving.

Due to the relatively insignificant amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such as garden maintenance, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the report.



Modified from Figure 11.3 of the CIRIA SuDS Manual (C753) (2015)

Permeable paving

Unlined permeable paving is proposed for driveway areas to intercept runoff. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2015) will improve water quality due to their filtration capacity and usually work to a 30% porosity. Paving could also implement an impermeable liner close to the building or create a separate compartment within the permeable sub-base close to the building to further divert attenuated water away from building foundations.

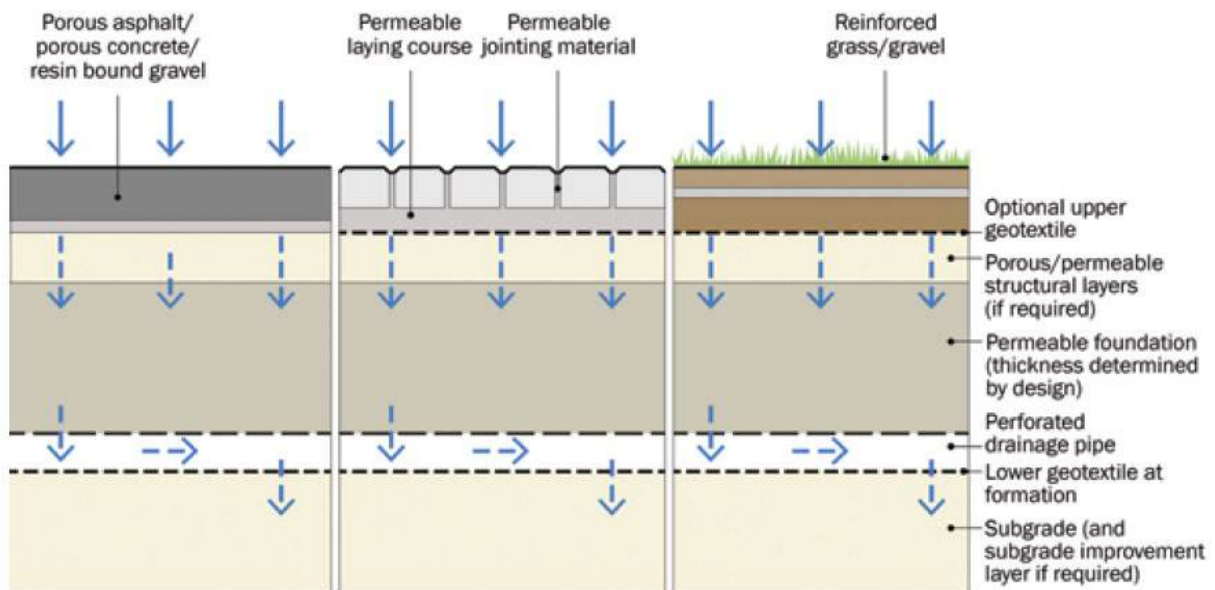


Figure 20.13 of the CIRIA SuDS Manual (C753) (2015)

Exceedance flows

Exceedance flow routes are included within the proposed SuDS drainage layout. Where possible, exceedance flows should be directed into non-essential areas of the Site such as the garden areas. The SuDS system recommended for the Site should provide enough storage that this method would only be utilised during a worst case scenario.

10 SuDS maintenance



Regular maintenance is essential to ensure effective operation of the SuDS features over the intended lifespan of the proposed development. The SuDS Manual (C753) (CIRIA, 2015) provides a maintenance schedule for SuDS with details of the necessary required actions as shown in the Table below.

Table 13. SuDS operation and recommended maintenance requirements

Asset type	Maintenance schedule (and frequency)
Permeable pavements	Regular maintenance: • Brushing and vacuuming (three times per year). • Trimming any roots and surrounding grass and weeds that may be causing blockages (annually or as required). Monitoring: • Initial inspection (monthly). • Inspect for poor performance and inspection chambers (annually).
Underground drainage pipe network	Regular maintenance: • Remove sediment and debris from pre-treatment devices and floor of inspection tube or chamber (annually). • Cleaning of gutters and any filters on downpipes (annually). • Trimming any roots that may be causing blockages (annually or as required). Monitoring: • Inspect silt traps and note rate of sediment accumulation (monthly in the first year and then annually).
Rainwater harvesting	Regular maintenance: • Inspection of tank for debris and sediment build up (annually and following poor performance). • Inspection of inlets, outlets, overflow areas, pumps and filters (annually and following poor performance). • Cleaning of tank, inlets, outlets, gutters, roof drain filters and withdrawal devices (annually or as required). Remedial actions: • Repair or overflow erosion damage or damage to tank and associated components (as required)

Health and safety considerations for SuDS

GeoSmart reports may include outline strategies or designs to support with development plans. Any drawings or advice provided do not comprise any form of detailed design. Implementation of any conceptual scheme options may constitute 'Construction Work' as defined by CDM Regulations (2015).

The CDM Regulations place specific Health and Safety duties on those commissioning, planning and undertaking construction works. If you are uncertain what this means you should seek the advice of your architect, builder or other competent professional.

GeoSmart does not provide health and safety advisory services but we are required to advise you of your general responsibilities under CDM (visit <http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/> for more information).

Please remember that detailed design work should be undertaken by a competent professional who might be your engineer, architect, builder or another competent party.

11 Background information

GeoSmart SuDS Infiltration Suitability Map (SD50)

The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the suitability for infiltration drainage in different parts of the Site and indicates where further assessment is recommended. In producing the SuDS Infiltration Suitability Map (SD50), GeoSmart used data from the British Geological Survey on groundwater levels, geology and permeability to screen for areas where infiltration SuDS may be suitable. The map classifies areas into 3 categories of High, Medium and Low suitability for infiltration SuDS. This can then be used in conjunction with additional data on Site constraints to give recommendations for SuDS design and further investigation.

The primary constraint on infiltration potential is the minimum permeability of the underlying material and in some cases the range in permeability may be considerable, ranging down to low. The map classifies these areas as moderate infiltration suitability requiring further investigation. In cases where the thickness of the receiving permeable horizon is less than 1.5 meters then additional Site investigation is recommended. If the Site is at risk of groundwater flooding for up to the 1% annual occurrence the map classifies these areas as moderate infiltration suitability requiring further investigation.

The GeoSmart SuDS Infiltration Suitability Map (SD50) is a national screening tool for infiltration SuDS techniques but a Site specific assessment should be used before final detailed design is undertaken. Further information on the GeoSmart SuDS Infiltration Suitability Map (SD50) is available at geosmartinfo.co.uk.

How was surface water runoff estimated from the Site?

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield runoff from the Site has been calculated using the IuH124 method and is assumed representative of the runoff generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the runoff complies with the NPPF (MHCLG, 2024). For the impermeable surfaces, it has been assumed that 100% runoff will occur (calculations provided in Appendix B). Rainfall data is derived from the Flood Estimation Handbook (FEH), developed by NERC (2009). Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

What is the peak discharge rate?

An estimation of peak runoff flow rate and volume is required to calculate infiltration, storage and discharge requirements. The peak discharge rate is the maximum flow rate at which surface water runoff leaves the Site during a particular storm event, without considering the impact of any mitigation such as storage, infiltration or flow control. Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. If all drainage is to infiltration there will be no discharge off-Site. Discharging all flow from Site at the existing 1 in 100 event would increase flood risk during smaller events. Flow restriction is generally required to limit the final discharge from Site during all events as a basic minimum to the green field QBAR rate. A more complex flow restriction which varies the final discharge rate from the Site depending on the storm event will reduce the volume of storage required on-Site. Drainage to infiltration SuDS is subtracted from the total discharge off-Site to achieve a beneficial net affect.

What is the total discharge volume?

The total discharge volume is calculated on the basis of the surface water runoff that has the potential to leave the Site as a result of the assumed 6 hour duration design storm event. The runoff is related to the underlying soil conditions, impermeable cover, rainfall intensity and duration of the storm event. The total volume generated by the current Site is compared to the potential total volume from the developed Site (not taking into consideration any mitigation). The difference provides the minimum total volume that will need to be stored and infiltrated on-Site or released at a controlled rate. Guidance indicates that the total discharge volume should never exceed the runoff volume from the development Site prior to redevelopment for that event and should be as close as is reasonably practicable to the Greenfield runoff volume.

12 Additional Products



The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
	Additional assessment: FloodSmart Report		The FloodSmart Report range provides clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at a Site. Our consultants assess available data to determine the level of risk based on professional judgement and years of experience. Please contact info@geosmartinfo.co.uk for further information.
	Additional assessment: EnviroSmart Report		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

13 References and glossary



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- Wiltshire Council (2015). Wiltshire Core Strategy. Accessed from: [https://www.wiltshire.gov.uk/media/372/Wiltshire-Core-Strategy-adopted-2015/pdf/Wiltshire Core Strategy 2015.pdf?m=1735555642237](https://www.wiltshire.gov.uk/media/372/Wiltshire-Core-Strategy-adopted-2015/pdf/Wiltshire%20Core%20Strategy%202015.pdf?m=1735555642237) on 02/12/25.
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Glossary

General terms

Attenuation	Reduction of peak flow and increased duration of a flow event.
Combined sewer	A sewer designed to carry foul sewage and surface water in the same pipe.
Detention basin	A vegetated depression, normally is dry except after storm events, constructed to store water temporarily to attenuate flows. May allow infiltration of water to the ground.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
FEH	Flood Estimation Handbook, produced by Centre for Ecology and Hydrology, Wallingford (formerly the Institute of Hydrology).
Filter drain or trench	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage, to store and conduct water, but may also be designed to permit infiltration.
First flush	The initial runoff from a site or catchment following the start of a rainfall event. As runoff travels over a catchment it will collect or dissolve pollutants, and the "first flush" portion of the flow may be the most contaminated as a result. This is especially the case for intense storms and in small or more uniform catchments. In larger or more complex catchments pollution.
Flood plain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions (see Environment Agency's Policy and practice for the protection of flood plains for a fuller definition).
Greenfield runoff	This is the surface water runoff regime from a site before development, or the existing site conditions for brownfield redevelopment sites.
Impermeable surface	An artificial non-porous surface that generates a surface water runoff after rainfall.
Permeability	A measure of the ease with which a fluid can flow through a porous medium. It depends on the physical properties of the medium, for example grain size, porosity and pore shape.

Runoff	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Sewerage undertaker	This is a collective term relating to the statutory undertaking of water companies that are responsible for sewerage and sewage disposal including surface water from roofs and yards of premises.
Soakaway	A subsurface structure into which surface water is conveyed to allow infiltration into the ground.
Source Protection Zone (SPZ)	Areas where groundwater supplies are at risk from potentially polluting activities and accidental releases of pollutants. They are a policy tool used to control activities close to water supplies intended for human consumption.
Treatment	Improving the quality of water by physical, chemical and/or biological means.

The terms included in this glossary have been taken from CIRIA (2015) guidance.

Data Sources

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Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2025 Ordnance Survey data © Crown copyright and database right 2025
Flood Risk (RoFRS/Pluvial/Surface Water Features/SPZ)	Environment Agency copyright and database rights 2025 Ordnance Survey data © Crown copyright and database right 2025
Flood Risk (Groundwater) and SuDS infiltration suitability (SD50)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2025) Contains British Geological Survey materials © NERC 2025 Ordnance Survey data © Crown copyright and database right 2025
Sewer Location	Contains Ordnance Survey data © Crown copyright and database right 2025 Contains Wessex Water search data 2025
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14 Appendices



Appendix A



Site plans



issued for: Planning

project: Stuart Little - 2 Self Build Plots - Land at New Road, Melksham, Wiltshire, SN127QZ project number:

drawing: Site Layout Plan - Option 4 drawing number: revision:

scale: 1:500 paper size: A1 drawn by: SB date: 19/11/25 checked: date: 19/11/25

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drawing: Site Layout Plan - Option 5 drawing number: revision:

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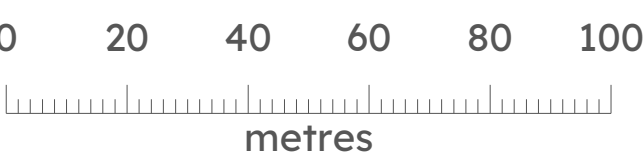
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drawing: Site Layout Plan - Option 6 drawing number: revision:

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drawing: Site Location Plan **drawing revision:** number:

scale:	paper size:	drawn by:	date:	checked:	date:
1:1250	A3	SB	16/11/25		16/11/25

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Appendix B



Rainfall runoff calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Node Type	Depth (m)
site	0.101	10.000	Manhole	0.550

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume
Winter CV	0.840	Additional Storage (m³/ha)	20.0	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0
30	0	10	0
100	0	10	0
100	45	10	0

Node site Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.03600	Invert Level (m)	9.450	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	116	Depth (m)	0.400
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	53.000		

Results for 2 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	site	84	9.541	0.091	5.0	6.5153	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
120 minute winter		site	Infiltration	2.3				

Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	site	96	9.632	0.182	12.0	21.2781	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
120 minute winter		site	Infiltration	2.7				

Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	site	112	9.685	0.235	15.4	29.8809	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
120 minute winter		site	Infiltration	2.7				

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	site	172	9.804	0.354	16.7	49.3095	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)					
180 minute winter	site	Infiltration	2.7					

Input parameters for run-off calculations	
Country	England
Total site area	4000 m^2
Area proposed for development	4000 m^2
Current permeable ground cover	4000 m^2
Current impermeable ground cover	0 m^2
Proposed permeable ground cover	2894.5 m^2
Proposed impermeable ground cover	1005 m^2
Urban Creep Allowance	10%
Final impermeable ground cover	1105.5 m^2
SPR	0.47
SAAR	773 mm
Region	8
Climate change factor	45%
Discharge Rate (l/s)	2.0
Run-off coefficient	100%

Current impermeable area as % of total	0%
Proposed impermeable area as % of total	28%
Change in permeable area (m2)	-1106
Change in impermeable area (m2)	1106
Change in impermeable area as % of total	28%

Rainfall event	Greenfield run-off rates (l/s)	Existing run-off rates(l/s)	Potential run-off rates without attenuation (l/s)	Potential minus exisiting (l/s)
QBAR	2.17	N/A	N/A	N/A
6 hour 1 in 1 year	1.84	1.84	2.76	0.91
6 hour 1 in 10 year	3.23	3.23	4.47	1.24
6 hour 1 in 30 year	4.06	4.06	5.83	1.78
6 hour 1 in 100 year	5.25	5.25	7.56	2.31
6 hour 1 in 100 year + 20% CC	N/A	N/A	9.07	3.83
6 hour 1 in 100 year + 45% CC	N/A	N/A	10.97	5.72

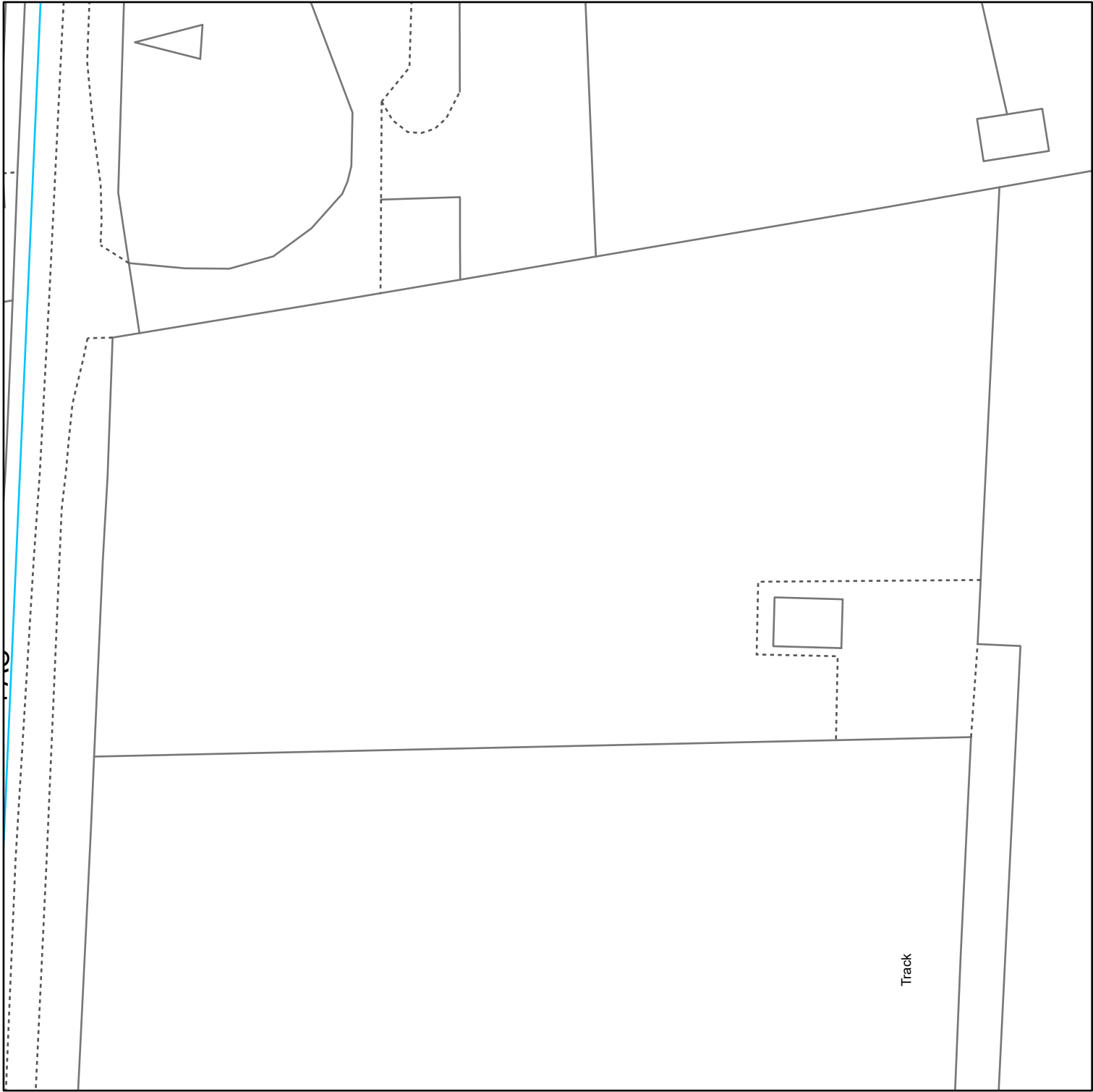
Rainfall event	Greenfield run-off volume (m ³)	Existing run-off volume (m ³)	Potential run-off volume without attenuation (m ³)	Potential minus existing (m ³)
QBAR	48.24	N/A	N/A	N/A
6 hour 1 in 1 year	45.40	45.40	59.55	14.15
6 hour 1 in 10 year	74.92	74.92	96.63	21.71
6 hour 1 in 30 year	96.09	96.09	126.03	29.95
6 hour 1 in 100 year	124.53	124.53	163.34	38.81
6 hour 1 in 100 year + 20% CC	N/A	N/A	196.01	71.48
6 hour 1 in 100 year + 45% CC	N/A	N/A	236.85	112.32

Appendix C



Wessex Water Asset Location Plan

Wessex Water Network Map



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WATER MAINS		SEWERS		STRATEGIC PUBLIC		PRIVATE		SECTION 104		OTHER WESSEX PIPES		NON-WESSEX / UNKNOWN	
Distribution	Washout	Foul	Surface	Foul	Surface	Foul	Surface	Foul	Surface	Rising Mains	Standby Rising Mains	Culverted Watercourse	Highway Drain
Raw Water	Abandoned	Abandoned	Abandoned	Abandoned	Abandoned	Abandoned	Abandoned	Abandoned	Abandoned	EDM	Overflow	Syphon	Status Unknown
Fittings		STRUCTURES		STRUCTURES		STRUCTURES		STRUCTURES		OTHER STRUCTURES		OTHER STRUCTURES	
Hydrant	Other	Manhole - Foul	Manhole - Surface	Manhole - Foul	Manhole - Surface	Manhole - Foul	Manhole - Surface	Manhole - Foul	Manhole - Surface	Attenuation Tank	Storage Tank	Chamber	Tunnel
		Bifurcation - Foul	Bifurcation - Surface	Bifurcation - Foul	Bifurcation - Surface	Bifurcation - Foul	Bifurcation - Surface	Bifurcation - Foul	Bifurcation - Surface	Interceptor			
		Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow	Combined Sewage Overflow				
		Inlet	Outfall	Inlet	Outfall	Inlet	Outfall	Inlet	Outfall	Pumping Station - Surface	Pumping Stn - Foul/Combined	Gully	Vent Column
		Lamphole	Lamphole	Lamphole	Lamphole	Lamphole	Lamphole	Lamphole	Lamphole	Rodding Eye	Catchpit	Flushing Chamber	Soakaway
		Non Return Valve	Non Return Valve	Non Return Valve	Non Return Valve	Non Return Valve	Non Return Valve	Non Return Valve	Non Return Valve	Air Valve	Hatch Box	Washout	

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Wessex Water
YTL GROUP

Date: 02/12/2025
Centre: 392277E, 165146N
Scale: 1:625
(when printed at A4 size)

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43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
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Fax: 01722 332296
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Liz Lloyd

Finance Manager

GeoSmart Information Limited

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Tel: 01743 298 100

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