

Table 5

SuDS Hierarchy

SuDS Component	Advantages	Limitations / Reason for Non-Selection
Infiltration (Soakaway)	Enables surface water runoff to be discharged directly to ground; reduces runoff volumes; minimises flood risk; no off-site discharge; aligns with the drainage hierarchy.	Requires routine inspection and maintenance to prevent clogging and ensure long-term performance. Maintenance arrangements are provided within this report.
Permeable Paving	Durable and sustainable; provides source control; filters pollutants; low long-term maintenance; supports infiltration and erosion control.	Higher initial installation cost compared to conventional paving; however, lifecycle benefits justify its inclusion where practicable.
Attenuation Pond	Provides attenuation storage to manage runoff rates and volumes, supporting controlled discharge to the receiving watercourse and reducing flood risk in accordance with SuDS principles.	An attenuation pond has been selected as the preferred solution in accordance with the drainage hierarchy, providing sufficient storage capacity and enabling controlled discharge to Slate Brook at green-field runoff rates.
Rainwater Harvesting	Reduces potable water demand; promotes water reuse; supports sustainable water management.	Limited reliability due to variable rainfall, high installation and maintenance costs and limited practical benefit for the scale of development.
Bioretention (Rain Gardens)	Reduces runoff volume and rate; improves water quality; enhances landscaping and biodiversity.	Insufficient landscaped area (approximately 69 m ²) to provide effective bioretention features.
Filter Strips and Swales	Provide runoff treatment; reduce soil erosion; improve water quality.	Require significant space and regular maintenance; site constraints limit feasibility.
Tanked Attenuation Systems	Can provide temporary storage where infiltration is not feasible.	Least sustainable option within the SuDS hierarchy; provides no water quality benefits and is not required, as attenuation can be achieved using the proposed bal-

SuDS Component	Advantages	Limitations / Reason for Non-Selection
		ancing pond. Limited space and reduced overall sustainability. Not proposed. Not proposed.
Green Roofs	Provide environmental benefits, improved thermal performance, and ecological value.	Not suitable due to pitched roof design, structural loading constraints, and maintenance requirements.

Table 6

Soil Classification Guide

Soil classification	Typical range for coefficient of permeability K (ms)	Typical range of CBR values
heavy clay	10^{-10} to 10^{-8}	2 to 5
silty clay	10^{-9} to 10^{-8}	3 to 6
sandy clay	10^{-9} to 10^{-6}	5 to 20
poorly graded sand	5×10^{-7} to 5×10^{-6}	10 to 40
well graded sand	5×10^{-6} to 10^{-4}	10 to 40
well graded sandy gravel	10^{-5} to 10^{-3}	30 to 80

Table 7

National Planning Policy Guidance defining Flood Zone 1

Guidance as having a 'Low Probability of flooding

Flood Zone	Definition
Zone 1 – Low Probability	Land having a less than 1 in 1,000 annual probability of flooding (<0.1%). The proposed development is located predominantly within Flood Zone 1 and is therefore considered appropriate in flood risk terms in accordance with the NPPF.

A small part of the site (access area) lies within Flood Zone 3; however, no built development is proposed within this area

Table 8

Extract from National Planning Policy Guidance: Flood Risk

Vulnerability and Flood Zone 'Compatibility'

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

KEY:

✓ DEVELOPMENT IS APPROPRIATE

✗ DEVELOPMENT SHOULD NOT BE PERMITTED

Table 9

Surface Water Drainage Strategy Summary (Hierarchy & Attenuation)

SuDS Stage / Hierarchy Level	Proposed Approach	Design Parameters	Outcome / Compliance
Infiltration (Primary Option)	Discounted due to unsuitable ground conditions (clay sub-grade and alluvial deposits)	N/A	In accordance with drainage hierarchy (NPPG)
Discharge to Watercourse	Surface water discharged to Slate Brook	Controlled via Hydro-Brake flow control device	Next preferred option in hierarchy
Source Control	Permeable paving and soft landscaped areas	Interception of first 5 mm rainfall	Provides water quality treatment and runoff reduction
Conveyance	Surface water pipe network	Designed for all storm events	Efficient routing of flows through site
Attenuation Storage	Attenuation pond (located adjacent to Slate Brook)	Estimated gross storage capacity 1,700 m ³	Manages runoff from all design events
Flow Control	Hydro-Brake flow control device	Restricted to greenfield runoff rates: • QBAR: 6.47 l/s • Q30: 15.55 l/s • Q100: 20.30 l/s	Meets LLFA discharge requirements
Climate Change Allowance	40% applied to rainfall intensity	1 in 100 year event + 40% climate change allowance	No flooding of buildings
Exceedance Flow Management	Overland flow routes directed to pond and watercourse	Designed exceedance routing	No increase in off-site flood risk

Table 9 provides a summary of the proposed surface water drainage strategy, including the drainage hierarchy, attenuation design, and key performance criteria.

Table 10

Permeable Block Paving Maintenance Schedule

Maintenance Type	Feature	Required Action	Frequency	Responsibility
Routine Maintenance	Permeable Block Paving	Remove weeds, debris, and organic material. Light brushing and surface cleaning to maintain surface permeability.	Quarterly	Occupier
Performance Monitoring	Permeable Block Paving	Inspect for cracking, settlement, ponding, surface damage, and blocked joints.	Twice yearly and after heavy rainfall	Occupier
Preventative Maintenance	Permeable Block Paving	Sweep the surface and remove litter, sediment, and detritus to prevent clogging of joints.	Monthly	Occupier
Remedial Maintenance	Permeable Block Paving	Replace damaged blocks, re-level depressed areas, and reinstate jointing material where necessary.	As required	Occupier
Deep Cleaning	Permeable Block Paving	Vacuum sweep or low-pressure wash to restore surface permeability where required.	Every 3–5 years or as needed	Specialist Contractor / Occupier

Maintenance shall be undertaken in accordance with CIRIA C753 (The SuDS Manual) and the manufacturer's guidance for the permeable paving system.

Table 11

Manhole / Inspection Chamber Maintenance Schedule

Maintenance Type	Feature	Required Action	Frequency	Responsibility
Routine Maintenance	Foul and Surface Water Drainage (Gullies, and Chambers)	Remove silt, leaves, debris, and organic material to maintain free flow and prevent blockage.	Annually	Owner / Occupier
Routine Maintenance	Demarcation Chamber	Remove accumulated silt and sediment from the chamber.	Quarterly	Owner / Occupier
Monitoring	Foul and Surface Water Drainage	Inspect chambers, gullies, and covers for signs of wear, damage, blockage, or surcharge.	Monthly	Owner / Occupier
Monitoring	Foul and Surface Water Drainage	Undertake detailed inspection of gullies and chambers.	Annually	Owner / Occupier
Monitoring	Demarcation Chamber	Inspect for contamination, sediment build-up, and structural condition.	Annually	Owner / Occupier
Remedial Maintenance	Foul and Surface Water Drainage	Remove and dispose of oil, fuel, or chemical residues using approved and safe disposal methods.	As required	Owner / Occupier / Specialist Contractor
Remedial Maintenance	Demarcation Chamber	Remove contaminated material and undertake cleansing in accordance with environmental regulations.	As required	Owner / Occupier / Specialist Contractor

Maintenance shall be undertaken in accordance with CIRIA C753 (The SuDS Manual) and relevant environmental protection, pollution prevention, and waste management regulations.