

Sustainable Drainage System Strategy

Site Address

Former Fox and Hounds Public House

26-27 London Road

Northfleet

Gravesend, DA11 9JH

23rd April 2025

Infiltration Testing

5no. trial pits were excavated to a maximum depths of up to 1.3mbgl (TP01 – TP05) for standard infiltration testing in accordance with BRE DG 365. The trial pits were rapidly filled with water from a 1.2m³ water bowser.

The maximum depth of the trial pits was 1.3mbgl, this was due to hard/dense ground conditions encountered and the excavation capabilities of the onsite plant machinery (1.5 tone excavator).

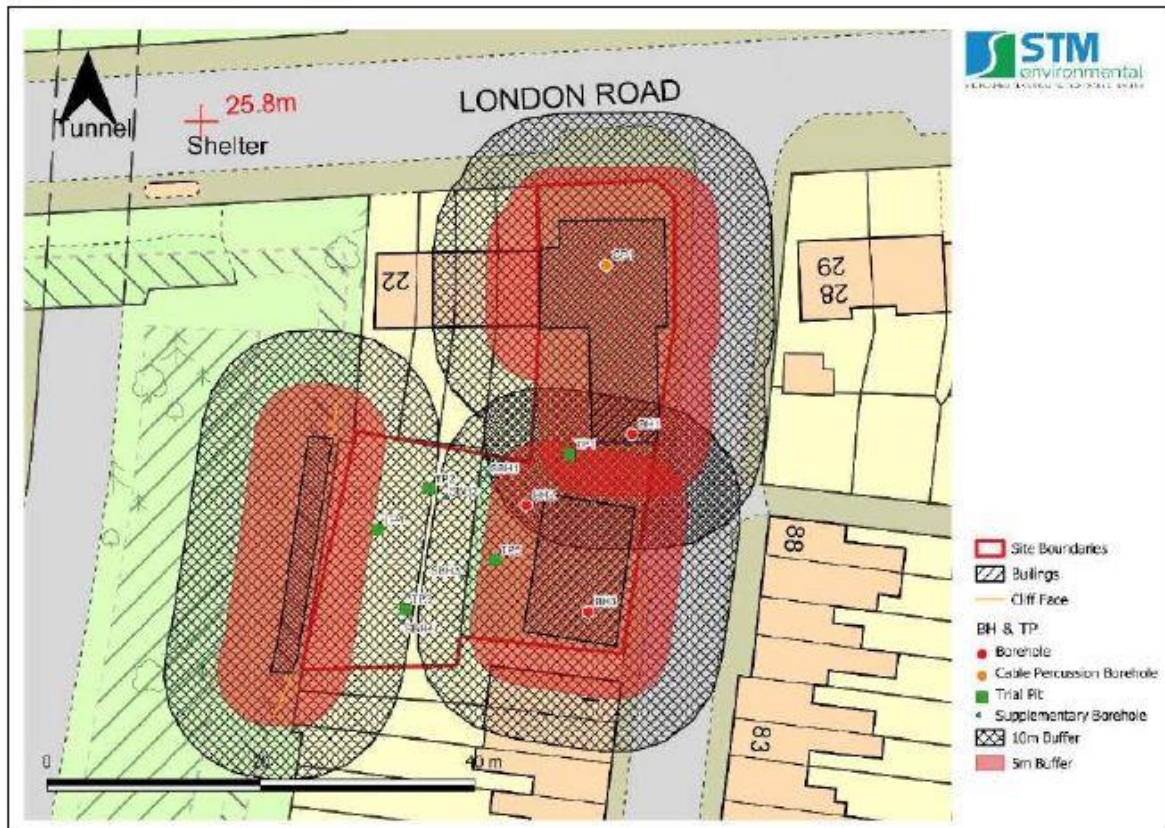
The trial pits were left to drain for a 24 - hour period or until nearly empty. The water level was continuously monitored using a water level logger. The water level achieved within the trial pits was used as the effective storage depth.

The infiltration rates obtained on site are available in Table 5 below. The average of TP01 – TP03 (1.0×10^{-5} m/s, 0.024m/hr) will be used throughout the report to allow for a conservative assessment of storage values.

Trial pits and associated depth and infiltration rate

Trial Pit	Depth	Infiltration Rate		Rate
		m/s	m/hr	
TP01	1.30	1.0×10^{-5}	0.028	Moderate
TP02	1.30	1.0×10^{-5}	0.026	Moderate
TP03	1.30	5.0×10^{-6}	0.018	Moderate
TP04	1.00	1.0×10^{-5}	0.029	Moderate
TP05	1.10	2.08×10^{-4}	7.5	Rapid

Site Investigation Map / Buffer Zones



Permeable Surfaces and Filter Drains

Approximately 51.5% of the development will consist of outdoor space, and patios which could be designed to be permeable and infiltration has been proven to be suitable on site. However, due to the potential for geological hazards to arise and potential contamination present at shallow depths, permeable surfaces that discharge to ground are not recommended.

SuDS Proposal

The proposal will introduce combined SuDS planters and rainwater butts which will allow for a minimal amount of water re-use. Small rain gardens will accept all rooftop runoff before discharging to a geocellular storage tank located within the car park to the rear of site.

All other hard standing will convey flows onto strategically placed filter strips and permeable paving to ensure suitable filtration and water quality measures are implemented around the site. These filtration mediums will also provide additional attenuation and natural reduce the runoff velocity as excess flows migrate through the structures – all excess flows will ultimately discharge via the geocellular tank storage.

Proposed SuDS

ID	Proposed Area (m ²)	SuDS Option	Estimated Storage Provided (m ³)
N/A	4.8	Combined Rainwater Butt and SuDS Planters	1.0
RG1	20	Rain Garden (0.5 - 0.6m thick)	2.4
P1a	60	Lined Permeable Paving – 350mm Sub-base	20
P2a	105	Lined Permeable Paving – 350mm Sub-base	
G1	150	Geocellular Storage (0.4 thick)	38
Total			61

Combined Rainwater Butts and SuDS Planters

Combined rainwater butts and SuDS planters are suited to this development. 5no. planters fitted to the downpipes of the proposed rooftops, as to act as a filtration medium while attenuating flow and removing sediment. These will also allow for 1.8m³ of rainwater re-use. These will provide a total of 1.0m³ of attenuation storage. Once at capacity the planters will discharge into the SuDS management train described below.

Rain Gardens

A Rain garden will be formed within the north site, south of the proposed building. The rain garden will cover a total of 20m², they will be formed from a minimum of 400mm of well-draining topsoil and covered in suitable planting (grasses and flora). The based of the raingardens will be formed from permeable MOT type 3 (no fines) aggregate. The sub-base will increase the attenuation and filtration potential and where suitable will allow for infiltration into the ground.

An overflow connection allow for excess flows to discharge further along the proposed system and to prevent flooding occurring during extreme events.

These will provide a total of 1.2m³ attenuation within the sub-base based on an average porosity of 0.3. The well-draining substrate will have a porosity of 0.15 providing a further 1.2m³ of attenuation.

Geocellular soakaway

The geocellular storage structures will be placed below the main car parking area to the front of the dwelling. The structure will cover a total area of 50m² with a thickness of 1.0m. The geocellular storage crates (AquaCell Drainage Crates or similar) will have a porosity of 95% and will be stacked together to create the desired storage volume of 38.0m³.