



Land East of Coolham Road

Drainage Strategy

Job Number: 1742

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Abbreviation	Definition
AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BGS	British Geological Survey
CIRIA	Construction Industry Research and Information Association
FRA	Flood Risk Assessment
GBR	General Binding Rules
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
PTP	Packaged Treatment Plant
QBAR	Mean Annual Flood Flow Rate (Greenfield Runoff Rate)
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems

1. Executive Summary

This report has been prepared to support the discharge of Condition 10 relating to foul and surface water drainage for the proposed development at Land East of Coolham Road, West Chiltington.

The development comprises a single Gypsy/Traveller pitch with associated hardstanding and ancillary structures. The total red line boundary extends to approximately 8,000m², with a drained development area of approximately 700m².

A site-specific drainage strategy has been developed based on a review of site topography and infiltration testing. BRE365 testing has confirmed that infiltration is not viable as a primary means of surface water disposal. The strategy has therefore been designed in accordance with the SuDS hierarchy, adopting attenuation and controlled discharge.

Surface water runoff will be managed at source through permeable paving constructed over an open-graded sub-base, providing interception, treatment and attenuation. Discharge will be restricted to the greenfield runoff rate (QBAR approximately 0.4l/s) and directed to the existing ditch along the eastern boundary. The site falls naturally toward this ditch, allowing a gravity-based drainage solution with no requirement for pumped infrastructure.

Foul drainage will be managed via a package treatment plant sized for the proposed development. Treated effluent will discharge to the same eastern boundary ditch, which has been confirmed by the client to contain water throughout the year and forms part of the local drainage network. The system will operate in accordance with the General Binding Rules.

The drainage strategy is proportionate to the scale of development and incorporates simple, robust and maintainable solutions. Runoff rates and volumes are controlled to greenfield conditions, and exceedance flows will follow natural topography without increasing flood risk elsewhere.

The proposed drainage arrangements comply with national policy, including the National Planning Policy Framework, Planning Practice Guidance and the 2025 National Standards for SuDS, as well as local policy requirements under the Horsham District Planning Framework.

The requirements of Condition 10 have been addressed, and the proposed strategy provides a suitable and policy-compliant solution for foul and surface water management at the site.

1.1 Policy Compliance Summary

Policy / Guidance	Requirement	Compliance
National Planning Policy Framework (NPPF)	Development should not increase flood risk elsewhere and should incorporate appropriate sustainable drainage where relevant.	Surface water runoff from the 700m ² drained area will be attenuated within the permeable paving sub-base and restricted to QBAR, calculated as approximately 0.4l/s, before discharge to the eastern ditch. The strategy ensures runoff is controlled to greenfield rates and does not increase flood risk elsewhere.
Planning Practice Guidance (PPG)	Surface water drainage should follow the drainage hierarchy, prioritising infiltration where suitable and requiring clear justification where lower-order destinations are used.	Infiltration has been assessed through BRE365 testing and is not viable as the primary discharge mechanism. The strategy therefore moves to the next appropriate hierarchy destination, controlled discharge to an above-ground surface water body.
National Standards for Sustainable Drainage Systems (SuDS), 2025, Standard 1	Runoff destinations should follow the hierarchy: non-potable reuse, infiltration, discharge to surface water body, surface water sewer, then combined sewer.	Rainwater reuse is not proportionate for the scale and use of the development. Infiltration has been tested and ruled out as the primary mechanism. Discharge to the existing eastern ditch is therefore the highest appropriate destination.
National SuDS Standards, Standard 1	Where discharge to third-party land or a receiving system is required, appropriate rights or evidence should be provided.	The eastern ditch forms part of the riparian ownership associated with the site. The client has confirmed that the ditch contains water throughout the year and forms the receiving drainage feature for the site.
National SuDS Standards, Standard 2	Everyday rainfall should be intercepted so that the first 5mm of rainfall for the majority of events does not result in runoff leaving the site.	Permeable hardstanding will intercept rainfall and runoff at source. Roof runoff will be distributed into the permeable system rather than discharged as concentrated point flow onto the surface.
National SuDS Standards, Standard 3	Extreme rainfall, including climate change, should be managed without increasing flood risk to the site or elsewhere.	The permeable paving sub-base will provide distributed attenuation for the 1% Annual Exceedance Probability (AEP) +40% climate change event, with controlled discharge to the eastern ditch. Exceedance flows will follow the natural fall of the site toward the eastern boundary.
National SuDS Standards, Standard 3	Where infiltration is proposed, ground conditions and infiltration rates must be suitable.	IBEX BRE365 testing recorded no determinable infiltration rate at either test location due to insufficient fall in head, so infiltration is not relied upon for compliance.
National SuDS Standards, Standard 4	Surface water runoff quality should be managed through an appropriate SuDS management train.	Permeable paving provides filtration, sediment capture, interception and treatment before controlled discharge. The proposed use is low pollution risk, with no industrial or high-risk activities proposed.
National SuDS Standards, Standard 5	SuDS should provide amenity benefits and be integrated into the layout where practicable.	The drainage system is incorporated within the hardstanding and ground-level layout, avoiding intrusive above-ground infrastructure and maintaining the rural character and usability of the pitch.
National SuDS Standards, Standard 6	SuDS should maximise biodiversity benefits proportionate to the scale and sensitivity of the development.	The strategy avoids culverting or engineered alteration of the eastern ditch, maintains natural drainage pathways, and limits new drainage infrastructure to the development footprint.
National SuDS Standards, Standard 7	Drainage systems should be capable of safe construction, operation and maintenance over the development lifetime.	The system is gravity-based, uses accessible permeable hardstanding, inspection points and a controlled outfall. A maintenance regime is proposed for sweeping, inspection, blockage clearance and post-storm checks.

Policy / Guidance	Requirement	Compliance
Horsham District Planning Framework (2015), Policy 35	Development should mitigate and adapt to climate change, including through sustainable construction and drainage.	The strategy uses SuDS, avoids pumping, manages surface water at source, includes a 40% climate change allowance, and restricts discharge to greenfield rates.
Horsham District Planning Framework (2015), Policy 38	Development should manage water resources and drainage appropriately, avoiding harm to water quality and drainage infrastructure.	Surface water is treated and attenuated through permeable paving before discharge to the eastern ditch. Foul drainage is treated via a package treatment plant sized for the development before discharge to the same watercourse.
Horsham District Council Drainage Comments	Permeable hardstanding must not comprise fines such as MOT Type 1 or road planings and should use material with a suitable void ratio.	The revised strategy specifies no-fines permeable construction over an open-graded sub-base, such as MOT Type 3 or equivalent, rather than compacted fine material.
Horsham District Council Drainage Comments	Exceedance flow routes must be considered and shown not to increase risk to people, property or nature.	Contour information shows a natural fall toward the eastern ditch. Exceedance flows will be directed away from the mobile home, touring caravan and dayroom, remaining within external areas before following the natural fall toward the ditch.
Horsham District Council Drainage Comments	Pollution prevention measures must be provided for groundwater and surface water receptors.	The permeable paving system provides source control and treatment. Foul drainage is separate and treated through the PTP. No high-risk activities are proposed, and routine maintenance will manage sediment and blockage risks.
Horsham District Council Drainage Comments	The receiving ditch/watercourse for treated effluent must be assessed, including ownership, flow condition, levels, connectivity and maintenance.	The eastern ditch is within the riparian ownership associated with the site and has been confirmed by the client to contain water year-round. The final outfall invert will be set at detailed design stage to ensure positive fall, prevent erosion and allow inspection and maintenance.

2. Introduction

This report has been prepared to support the discharge of Condition 10 attached to the planning permission for development at Land East of Coolham Road, West Chiltington, West Sussex RH20 2LT.

Condition 10 requires the submission and approval of a drainage strategy detailing the means of foul and surface water disposal prior to occupation. This document provides a proportionate drainage response, addressing the requirements of the Local Planning Authority (Horsham District Council) and responding directly to the comments issued by the Council's drainage officer.

The report builds upon the previously submitted Site Development Scheme and drainage drawing, incorporating additional technical information and clarification where requested. In particular, it reflects the findings of site-specific infiltration testing undertaken in accordance with BRE365, and sets out a revised drainage approach where appropriate.

The proposed development comprises a single Gypsy/Traveller pitch with associated hardstanding and ancillary structures. The total red line boundary extends to approximately 8,000m², with the drained development area comprising approximately 700m² of hardstanding and roofed surfaces.

Surface water drainage is addressed through a sustainable drainage systems (SuDS) approach, with runoff managed at source through permeable construction and controlled discharge. Foul drainage is proposed via a package treatment plant discharging to the adjacent ditch along the eastern boundary of the site.

The purpose of this report is to demonstrate that the proposed drainage strategy is suitable for the site, does not increase flood risk on or off site, and accords with relevant national and local policy, including the 2025 National Standards for Sustainable Drainage Systems.





FIGURE 2 – PROPOSED SITE LAYOUT

3. Site Description and Existing Conditions

The site is located to the east of Coolham Road, West Chiltington, West Sussex RH20 2LT. The red line planning boundary extends to approximately 8,000m² and comprises predominantly undeveloped land with an existing access connection from Coolham Road.

Topography across the site varies from approximately 36.5m AOD in the western and south-western parts of the site, falling generally toward the eastern boundary where levels reduce to approximately 33.0–34.5m AOD. The site therefore exhibits a clear natural fall toward the eastern boundary, where an existing ditch is present. This ditch forms part of the local drainage network and represents the natural receiving feature for runoff from the site and surrounding land.

The eastern ditch lies within the riparian corridor associated with the site and has been confirmed by the client to contain water throughout the year. It is understood to provide onward connectivity within the wider drainage network, although detailed survey of downstream conditions has not been undertaken at this stage.

Ground conditions at the site have been investigated through BRE365 infiltration testing undertaken by IBEX Consulting. Trial pits identified Topsoil over Head Deposits, underlain by Weald Clay Formation at depth. Groundwater was not encountered during the investigation. Infiltration testing undertaken within two trial pits did not produce a determinable infiltration rate due to insufficient fall in head over the test period, indicating that infiltration is not viable as a primary drainage mechanism.

Existing drainage infrastructure within the site is limited, and there are no formal surface water or foul drainage systems currently serving the land. Surface water runoff is assumed to follow natural overland flow paths toward the eastern ditch in accordance with the prevailing topography.

The surrounding area is characterised by a mix of rural land uses and low-density development, with drainage typically managed through a combination of natural drainage features, including ditches and field drains, and private treatment systems where properties are not connected to the public sewer network.



FIGURE 3 – EXISTING SITE PLAN AND TOPOGRAPHICAL SURVEY

4. Development Proposals

The proposed development comprises the provision of a single Gypsy/Traveller pitch, including a mobile home, touring caravan and associated dayroom, with access and circulation areas formed in permeable hardstanding.

The total red line boundary extends to approximately 8,000m². The area of proposed hardstanding and roofed development requiring drainage is approximately 700m², with the remainder of the site retained as undeveloped land.

Access to the site is taken from Coolham Road, with internal circulation and parking areas constructed using permeable materials. Roofed elements will comprise the mobile home and dayroom structures, with roof runoff directed into the surface water drainage system.

The development has been arranged to respond to the existing site topography, maintaining the natural fall of the land toward the eastern boundary. No significant regrading of the wider site is proposed, and the drainage strategy has been developed to work with the existing levels and natural flow paths.

Surface water drainage will be managed through a permeable paving system with underlying open-graded storage, providing interception, treatment and attenuation prior to controlled discharge. Foul drainage will be served by a package treatment plant located within the site, discharging to the existing ditch along the eastern boundary.

The layout has been developed to ensure that both surface water and foul drainage can be conveyed by gravity toward the eastern boundary, in accordance with the prevailing topography.

5. Planning Condition and Consultation Response

Planning permission for the development includes Condition 10, which requires the submission and approval of a detailed drainage strategy for both foul and surface water prior to occupation of the site.

A Site Development Scheme and supporting drainage information were previously submitted in response to this condition. Horsham District Council reviewed the submission and issued a consultation response requesting further clarification and additional technical information before the condition could be discharged.

In relation to surface water drainage, the Council raised concerns regarding the reliance on infiltration as the primary means of disposal, the absence of attenuation within the proposed design, and the lack of defined exceedance flow routing. The submitted unbound surface detail was not accepted as a permeable construction in its current form, with specific reference made to the need for a no-fines material with an appropriate void ratio. The Council also noted that direct point discharge of roof water onto permeable surfaces is not considered best practice without appropriate distribution or pre-treatment.

In relation to foul drainage, the Council requested further information to support the proposed discharge from the package treatment plant to the eastern ditch. This included confirmation of ownership or permission to discharge, evidence of the ditch flow regime, expected water levels, outfall invert levels, and an understanding of the wider connectivity of the receiving drainage feature. Clarification was also sought regarding maintenance and management arrangements, and whether any separate regulatory consents may be required.

This report has been prepared to address each of these points. It incorporates the findings of site-specific infiltration testing, clarifies the proposed permeable construction and surface water management approach, and provides additional justification and supporting information in relation to the proposed foul drainage outfall.

6. Drainage Strategy Overview

The drainage strategy for the site has been developed in accordance with a sustainable drainage systems (SuDS) approach, managing runoff at source and working with the natural topography of the site.

The site exhibits a clear fall from west to east toward the existing ditch along the eastern boundary, which forms the natural receiving feature for the development. Both surface water and foul drainage have been designed to discharge to this location by gravity, avoiding the need for pumping and maintaining a simple, low-maintenance system.

Site-specific BRE365 infiltration testing has confirmed that infiltration is not viable as the primary means of surface water disposal. The strategy has therefore been developed on the basis of attenuation and controlled discharge, in accordance with the SuDS hierarchy, with discharge directed to the existing eastern ditch.

Surface water runoff from the proposed development area of approximately 700m² will be managed through permeable hardstanding constructed using no-fines materials over an open-graded sub-base. This provides interception, treatment and storage within the pavement structure, with flows conveyed to a controlled outfall. Discharge will be restricted to the equivalent greenfield runoff rate (QBAR), calculated as approximately 0.4l/s for the contributing area, prior to discharge to the ditch.

Foul drainage will be served by a package treatment plant sized appropriately for the proposed development. Treated effluent will discharge to the same eastern ditch, which has been confirmed to contain water throughout the year and forms part of the local drainage network.

The strategy ensures that runoff is managed on site, peak discharge rates are controlled, and both surface water and foul flows are directed to an appropriate receiving feature, without increasing flood risk elsewhere.

7. Policy and Guidance Context

This assessment has been prepared in accordance with national and local planning policy relating to flood risk and drainage.

At the national level, the National Planning Policy Framework (NPPF, December 2024) requires development to be directed away from areas at highest risk of flooding and to be safe for its lifetime without increasing flood risk elsewhere. This is achieved through the application of a sequential, risk-based approach to site layout and design.

The NPPF confirms that the aim of the Sequential Test is to steer development to areas with the lowest flood risk. However, paragraph 175 states that the Sequential Test is not required where a site-specific Flood Risk Assessment demonstrates that no built development, including access or other vulnerable elements, would be located within areas at risk of flooding, now or in the future.

The Planning Practice Guidance (PPG) supports this approach and confirms that site-specific Flood Risk Assessments should consider all sources of flooding and demonstrate how flood risk is managed over the lifetime of development.

At the local level, the Horsham District Planning Framework (HDPF) requires development to manage surface water sustainably and to avoid increasing flood risk both on-site and elsewhere. Policy 38 specifically supports the use of Sustainable Drainage Systems (SuDS) and requires development proposals to incorporate appropriate surface water management measures having regard to the nature and scale of development.

West Sussex County Council, as Lead Local Flood Authority (LLFA), also requires development proposals to follow the drainage hierarchy and demonstrate that runoff rates and volumes are appropriately controlled through the use of SuDS in accordance with national standards and guidance.

The Horsham District Strategic Flood Risk Assessment (SFRA) provides a strategic overview of flood risk across the district and supports the application of a risk-based approach to development planning. The SFRA confirms that site-specific Flood Risk Assessments and drainage strategies may be required to refine flood risk considerations and demonstrate that development will remain safe for its lifetime without increasing flood risk elsewhere.

Horsham District Council's local validation requirements for drainage submissions require consideration of all sources of flooding, the incorporation of climate change allowances where relevant, and demonstration that appropriate drainage arrangements are provided in accordance with the National Standards for SuDS.

8. Surface Water Drainage Strategy

8.1 Drainage Hierarchy and Strategy Overview

Surface water management for the proposed development has been designed in accordance with the drainage hierarchy set out within the National Standards for Sustainable Drainage Systems (SuDS), updated July 2025, together with CIRIA C753.

In accordance with Standard 1, runoff destinations are prioritised in the following order:

1. *Collection for non-potable use.*
2. *Infiltration to ground.*
3. *Discharge to an above ground surface water body.*
4. *Discharge to a surface water sewer.*
5. *Discharge to a combined sewer.*

The site comprises undeveloped greenfield land. Site-specific infiltration testing has been undertaken in accordance with BRE365, which confirmed that infiltration is not viable as a primary means of surface water disposal, with no determinable infiltration rate recorded due to insufficient fall in head during testing.

The drainage strategy has therefore been developed on the basis of attenuation and controlled discharge, in accordance with the SuDS hierarchy, with discharge directed to the existing ditch along the eastern boundary of the site.

The total red line boundary extends to approximately 8,000m². The drained development area comprises approximately 700m² of hardstanding and roofed surfaces, and this has been adopted as the contributing area for surface water runoff.

Surface water will be managed through a permeable paving system constructed over an open-graded granular sub-base. The permeable paving will provide interception, treatment and attenuation storage, while allowing incidental infiltration where ground conditions permit.

All hardstanding areas, including pitches and access, will drain to the permeable paving system. Roof water from mobile homes, touring caravans and associated structures will discharge to the permeable sub-base via distributed connections, ensuring even loading and source control across the development footprint.

Greenfield runoff rates have been estimated using the UK SuDS Greenfield Runoff Rate Estimation Tool for a site area of 0.07ha. The calculated QBAR rate is approximately 0.4l/s.

Under the proposed design, surface water runoff will be attenuated within the permeable paving sub-base and discharged at a controlled rate equivalent to the greenfield runoff rate (QBAR) to the ditch located along

the eastern boundary of the site. This ditch represents the natural receiving feature for the site and forms part of the local drainage network.

The strategy provides distributed storage and source control across the development area and does not rely on centralised attenuation features or off-site infrastructure upgrades.

The approach ensures that:

- Surface water runoff is managed in accordance with the SuDS hierarchy
- Discharge is restricted to greenfield runoff rates
- Runoff is directed to an appropriate receiving watercourse
- There is no increase in flood risk elsewhere

The proposed drainage strategy is proportionate to the scale and nature of the development and provides a clear and compliant approach to surface water management.

8.2 Design Basis

The contributing development area is approximately 0.07ha, corresponding to the proposed hardstanding and roofed footprint.

Surface water drainage is provided via a permeable paving system constructed over an open-graded granular sub-base, which provides attenuation storage and facilitates incidental infiltration where ground conditions permit.

BRE365 testing has confirmed that infiltration is not viable as a primary discharge mechanism. The drainage design is therefore based on attenuation and controlled discharge rather than infiltration.

The drainage system has been designed for the 1% Annual Exceedance Probability (AEP) rainfall event including a 40% climate change allowance.

Surface water runoff will be discharged at a controlled rate equivalent to the greenfield runoff rate (QBAR approximately 0.4l/s) to the ditch located along the eastern boundary of the site. This ensures that runoff rates and volumes do not exceed the existing greenfield condition.

Surface water is managed close to source and at or near ground level, integrated within the layout and hard landscape design. The use of permeable paving provides distributed storage, flow control and water quality benefits in accordance with the SuDS approach defined within the 2025 standards.

The design does not rely on infiltration performance to achieve compliance and does not require connection to a surface water or combined sewer network.

8.3 Compliance with the National Standards for SuDS (2025)

Compliance with Standards 1 to 7 is summarised in Table 8.1.

Table 8.1 – Summary of Compliance with the National Standards for SuDS

Standard	Requirement Summary	Site Response
Standard 1 Runoff Destinations	Apply SuDS hierarchy and prioritise higher order destinations	Infiltration has been tested on site in accordance with BRE365 and is not viable as a primary discharge mechanism. Surface water is therefore discharged to the existing ditch along the eastern boundary, representing the highest appropriate tier in the hierarchy
Standard 2 Everyday Rainfall (Interception)	First 5mm rainfall to be intercepted for majority of events	Permeable paving provides interception, storage and treatment at source. Runoff from hardstanding and roofed areas is distributed into the permeable system, reducing runoff for smaller rainfall events and aligning with a SuDS management train
Standard 3 Extreme Rainfall and Flooding	Manage 1% AEP event + climate change. Control discharge where applicable	Attenuation is provided within the permeable sub-base, with controlled discharge at QBAR (0.4l/s) ensuring runoff rates and volumes are restricted to greenfield conditions. Exceedance flows follow natural topography toward the eastern boundary without increasing flood risk
Standard 4 Water Quality	Provide appropriate SuDS management train and pollution control	Permeable paving provides filtration and sediment capture, forming part of a source control SuDS management train prior to discharge to the receiving ditch
Standard 5 Amenity	Deliver multifunctional, visually integrated SuDS	The drainage strategy is integrated within the site layout at ground level, avoiding intrusive infrastructure and maintaining usable site space consistent with the scale of development
Standard 6 Biodiversity	Maximise biodiversity benefit proportionate to scale	The strategy utilises existing drainage pathways and avoids culverting or engineered channels, maintaining natural site function without adverse ecological impact
Standard 7 Construction, Operation and Maintenance	Ensure structural integrity and maintenance planning	The permeable paving system provides a simple, distributed drainage solution with no reliance on mechanical components, allowing straightforward inspection, maintenance and long-term operation

SuDS Component	Description	Site Suitability	Comments
Green Roofs	A vegetated soil layer installed on the roof of a building, creating a living surface. It stores water in the soil, which is absorbed by the plants.	X	Not suitable. The proposed statics, tourers and dayrooms are lightweight structures not designed to support green roof loading. Surface water is instead managed at ground level through permeable paving and sub-base attenuation.
Rainwater Reuse	Rainwater is collected from rooftops and other paved surfaces and stored in aboveground or underground tanks. The stored water is treated and reused locally, typically for irrigation and toilet flushing.	X	Not incorporated. Although higher in the hierarchy, the scale of development and limited non-potable demand make this impractical. Surface water is instead managed through source control and distributed attenuation within permeable paving.
Soakaways	An underground pit filled with gravel or rubble designed to quickly absorb water into permeable soil layers. It allows water to seep gradually into the ground, preventing surface runoff.	X	Not utilised. Site-specific BRE365 testing confirmed that infiltration is not viable as a primary discharge mechanism. Storage and flow control are provided within the permeable paving sub-base with controlled discharge to the eastern boundary ditch.
Rain Gardens	Grassed or planted areas where runoff flows across, promoting infiltration and natural filtration of pollutants.	X	Not required. Attenuation and treatment are provided within the permeable paving system. Additional vegetated features are not necessary to achieve hydraulic or water quality performance for a development of this scale.
Permeable Paving	Paving that allows water to pass through gaps between solid blocks or through porous materials, enabling water to soak into the ground or be stored in the sub-base below.	✓	Primary SuDS feature. Constructed over an open-graded granular sub-base providing attenuation storage and incidental infiltration. Provides source control, interception and treatment, with discharge restricted to greenfield runoff rates (QBAR 0.4l/s) to the ditch along the eastern boundary.
Bioretention	A vegetated zone with layers of gravel and sand designed to channel, filter, and cleanse water as it seeps vertically. Water can either infiltrate into the ground or be drained through perforated pipes for further conveyance.	X	Not required. Water quality treatment is achieved through filtration within the permeable paving and sub-base. The scale and low pollution risk of the development do not justify additional engineered bioretention features.
Swales	Shallow, landscaped depressions designed to channel and filter water. Swales can be "wet" with surface water retention or "dry" with subsurface water infiltration through a gravel layer.	X	Not required. The layout follows natural drainage patterns and does not require surface conveyance features. Exceedance flows will follow the natural fall of the site toward the eastern boundary ditch.
Hardscape Storage	Constructed water storage features integrated into urban landscapes, storing runoff above ground within designed containers. These features can enhance public spaces with both aesthetic and functional benefits.	X	Not required. Attenuation is provided within the permeable paving sub-base. There is no requirement for additional above-ground storage structures.
Ponds/Basins	Water bodies designed for stormwater management. "Wet" ponds maintain a constant water level with plants for habitat, while "dry" basins store temporarily during rainfall events and allow for infiltration or controlled release.	X	Not suitable. The scale of development and distributed drainage approach remove the need for centralised attenuation features. Storage is provided within the permeable paving system.
Stormwater Wetlands	Wetlands are shallow, vegetated water bodies with fluctuating water levels. They utilise specially selected plant species to filter and purify water. Water flows horizontally through these plants, undergoing gradual treatment.	X	Not required. Water quality treatment is achieved within the permeable paving system. There is no requirement for downstream ecological polishing features for this low-risk development.
Geocellular Systems	Water can be stored underground in tanks, gravel beds, or plastic crates to provide attenuation and manage runoff.	X	Not required. The permeable paving sub-base provides sufficient attenuation storage. Additional underground tank systems are unnecessary given the distributed design approach.

FIGURE 4 – SUDS SITE SUITABILITY

8.4 Infiltration Feasibility

The drainage strategy has been developed in accordance with the surface water drainage hierarchy, which prioritises infiltration where ground conditions permit. In this case, infiltration has been tested but is not viable as the primary means of surface water disposal.

Site-specific infiltration testing was undertaken in accordance with BRE365. Two trial pits were excavated and tested, with no determinable infiltration rate recorded due to insufficient fall in head during the test period. This confirms that infiltration is not suitable as a primary discharge mechanism at the site.

Ground conditions comprise superficial Head deposits overlying the Weald Clay Formation. While limited infiltration may occur locally within the upper strata, this is considered incidental and cannot be relied upon to achieve the required drainage performance.

The drainage strategy has therefore been developed on the basis of attenuation and controlled discharge, in accordance with the SuDS hierarchy.

The site is not located within a Groundwater Source Protection Zone, and there is no evidence to suggest groundwater constraints that would preclude the use of shallow sub-base storage within permeable paving. Any localised infiltration that does occur will provide a secondary benefit but is not required to achieve compliance.

Surface water will therefore be attenuated within the permeable paving sub-base and discharged at a controlled rate equivalent to the greenfield runoff rate (QBAR approximately 0.4l/s) to the ditch along the eastern boundary.

Should infiltration performance be shown to improve locally during construction, this would provide additional resilience within the system. The strategy does not depend on infiltration and remains compliant without it.

8.5 Permeable Paving System Design

Permeable paving is proposed across all new hardstanding within the development, including access routes and areas serving the static and touring units.

The permeable paving system will capture and store surface water runoff within the underlying sub-base, providing distributed attenuation and facilitating incidental infiltration where ground conditions permit. The system provides source control, attenuation and treatment of surface water within a single integrated feature.

The system comprises permeable block paving laid over a bedding layer and an open-graded granular sub-base, which provides temporary storage within the voids of the aggregate. The sub-base will be designed to accommodate runoff from the contributing development area and to control discharge to the receiving ditch.

For design purposes, the system is sized to accommodate runoff from the 1% Annual Exceedance Probability (AEP) storm event, including a 40% climate change allowance, with discharge restricted to the greenfield runoff rate (QBAR approximately 0.4l/s).

Surface water runoff will be conveyed from the permeable sub-base via a controlled outfall to the ditch along the eastern boundary of the site. This ensures that runoff rates and volumes do not exceed the existing greenfield condition.

The permeable paving system provides distributed storage across the site, integrates with the site layout, avoids the need for centralised attenuation features, and does not rely on pumped systems or downstream infrastructure capacity.

8.6 Exceedance and Residual Risk

The permeable paving system has been designed to accommodate runoff from the 1% Annual Exceedance Probability (AEP) rainfall event, including a 40% climate change allowance. Under this design standard, surface water will be stored temporarily within the permeable paving sub-base and discharged at a controlled rate to the ditch along the eastern boundary.

Exceedance of the design event represents a low-probability scenario. In the event of rainfall exceeding the 1% AEP plus climate change standard, temporary surcharge would occur within the permeable paving structure before any surface emergence.

Finished levels across the development will be arranged such that any exceedance flows remain within external hardstanding areas and are directed away from mobile homes, touring areas and associated structures. Overland flow will follow the natural topographical gradient toward the eastern boundary, consistent with existing site conditions, and will discharge toward the ditch.

The proposed development does not obstruct existing overland flow pathways and does not introduce built form within areas that convey surface water. Exceedance flows will therefore be conveyed safely across the site without increasing flood risk elsewhere.

Residual risk associated with extreme rainfall events is limited and is managed through site layout, level design and the distributed attenuation provided by the permeable paving system.

The development:

- Does not increase runoff rates or volumes off-site.
- Does not introduce built form within identified flow paths.
- Remains operational and safe during exceedance events.

Residual flood risk is considered low and appropriately managed through the proposed drainage strategy and site layout.

9. Surface Water Maintenance Strategy

The surface water drainage system will be constructed and maintained in accordance with the Building Regulations and the recommendations of CIRIA C753 The SuDS Manual. The proposed permeable paving system is gravity-based and does not rely on mechanical components, which reduces long-term operational risk and maintenance burden.

Routine inspection and maintenance will ensure continued hydraulic performance and pollutant removal efficiency over the lifetime of the development.

Component	Element	Maintenance Activity	Frequency	Method / Standard
Permeable paving	Surface course (blocks/joints)	Visual inspection for silt build-up, weed growth, staining, damage and localised ponding	Monthly and after significant rainfall events	Walkover inspection; record defects and areas of reduced permeability
Permeable paving	Surface course (blocks/joints)	Mechanical sweeping / vacuum cleaning to remove fines and maintain infiltration capacity	Twice yearly (spring and autumn) or as required	Suction sweeper or vacuum unit suitable for permeable paving
Permeable paving	Jointing material	Refill jointing aggregate where loss has occurred	Annually or as required	Replace with appropriate permeable jointing aggregate
Permeable paving	Surface integrity	Localised repairs to cracked, settled or damaged blocks	As required	Lift and relay blocks; reinstate bedding and jointing material
Permeable paving	Sub-base (attenuation layer)	Monitor performance via surface indicators (persistent ponding or slow drainage)	Ongoing during inspections	Investigate affected areas; remedial cleaning or localised excavation if necessary
Drainage inlets / connections	Roof and hardstanding connections to sub-base	Inspect and clear debris, silt and blockages	Quarterly	Manual clearing and flushing where required
Inspection chambers	Chambers and covers	Inspect structural condition and check for silt accumulation	Quarterly	Open covers, remove debris and confirm free flow
Flow control device	Orifice / control chamber (if installed)	Inspect for blockage, debris and confirm correct operation	Quarterly and after storm events	Clean orifice plate, remove obstructions, check discharge rate visually
Outfall to watercourse	Headwall / pipe outfall	Inspect for blockage, siltation, vegetation growth, erosion or scour	Quarterly and after storm events	Remove debris, cut back vegetation, reinstate erosion protection if required

Component	Element	Maintenance Activity	Frequency	Method / Standard
Ordinary watercourse interface	Discharge point and immediate channel	Check for backwater effects, obstruction or localised erosion	Quarterly	Visual inspection; minor clearance works as required
General site drainage	Hardstanding and flow routes	Inspect for localised flooding, settlement or altered flow paths	Monthly	Walkover inspection; rectify defects affecting drainage performance
Extreme event inspection	Entire system	Post-event inspection following significant rainfall events	After major storms	Check all components for surcharge, damage or blockage; undertake remedial works as required

Notes

Maintenance activities are straightforward and can be undertaken using standard equipment without specialist intervention. The permeable paving system provides a distributed form of drainage, reducing reliance on single points of failure and simplifying long-term management.

A maintenance log should be kept by the site owner or management company, recording inspections, actions taken and any remedial works undertaken. This will ensure the system continues to operate effectively and in accordance with SuDS requirements over the lifetime of the development.

10. Foul Water Drainage

Foul drainage from the proposed development will be managed via a package treatment plant (PTP) located within the development area. The proposed location is shown on Figure 2 – Proposed Site Layout.

The development comprises a single Gypsy/Traveller pitch, including a mobile home, touring caravan and associated dayroom. Foul flows from these units will be collected via a private drainage network and conveyed to the treatment plant.

The PTP will treat effluent to an appropriate standard prior to discharge to the ditch located along the eastern boundary of the site. This ditch forms part of the local drainage network and has been confirmed by the client to contain water throughout the year, providing a suitable receiving environment for treated discharge.

The system will be designed and installed in accordance with the General Binding Rules for small sewage discharges. These rules allow discharge of treated effluent to a surface water body without the need for an Environmental Permit, subject to compliance with criteria relating to discharge volumes, treatment standards, siting and maintenance.

The treatment plant will be sized appropriately for the proposed development and installed to ensure gravity-fed drainage from the contributing units. This avoids the need for pumped infrastructure and provides a simple and reliable system.

The discharge point will be arranged to ensure positive fall from the treatment plant to the receiving ditch, with the outfall designed to prevent erosion, blockage or adverse environmental effects.

Responsibility for operation and maintenance of the treatment plant will rest with the site owner. The system will be subject to routine inspection, desludging and servicing in accordance with manufacturer's recommendations to ensure continued compliance with the General Binding Rules.

The proposed foul drainage strategy provides a compliant and sustainable solution for the treatment and disposal of foul effluent, with no reliance on connection to the public sewer network.

10.1 Population Equivalent and Treatment Plant Capacity

The proposed development comprises a single Gypsy/Traveller pitch, including a mobile home, touring caravan and associated dayroom. For the purposes of foul drainage design, a conservative population equivalent (PE) has been adopted to ensure adequate treatment capacity.

In accordance with typical design guidance for small domestic developments, the pitch is assumed to accommodate up to 4–6 persons. On this basis, a design population equivalent of 6PE has been adopted.

The package treatment plant will be selected to meet or exceed this design capacity and will be certified to an appropriate treatment standard (e.g. BS EN 12566). The selected unit will be capable of treating domestic wastewater to a level suitable for discharge to a surface water body under the General Binding Rules.

Daily discharge volumes are expected to remain well within the limits prescribed by the General Binding Rules for discharge to a surface watercourse. The system will therefore operate within accepted thresholds for small-scale domestic treatment systems.

The treatment plant will be installed in accordance with manufacturer's guidance, including appropriate separation distances, access for maintenance, and provision for desludging.

The proposed capacity provides sufficient allowance for peak occupancy and ensures that the system will operate effectively under normal and variable loading conditions.

10.2 Foul Drainage Layout and Discharge

Foul drainage from the proposed development will be collected via a private gravity drainage network serving the pitch and conveyed to a PTP located within the site, as shown on Figure 2 – Proposed Site Layout.

The mobile home, touring caravan and associated dayroom will connect to the internal foul drainage network. The layout has been arranged to follow the natural fall in levels across the site toward the eastern boundary, allowing gravity drainage to the treatment plant and onward to the discharge point, and avoiding the need for pumped infrastructure.

The PTP will treat effluent to an appropriate standard prior to discharge to the ditch located along the eastern boundary of the site. This ditch forms part of the local drainage network and has been confirmed by the client to contain water throughout the year.

The proposed discharge will comply with the General Binding Rules for small sewage discharges, including limits on daily discharge volume and treatment performance standards. Based on a design population of 6PE, the estimated discharge is approximately 0.9m³/day, which is well below the threshold for discharge to a surface water body under these rules.

The discharge point will be arranged to ensure positive fall from the treatment plant to the receiving ditch and designed to avoid erosion, scour or localised environmental impact.

The drainage system will be designed and constructed in accordance with relevant standards, including appropriate pipe gradients, inspection chambers and access points to ensure effective operation and maintenance. All components will be located within the site boundary and will be accessible for servicing.

The proposed foul drainage arrangement provides a simple and robust solution, with a single treatment point and gravity-fed network, avoiding reliance on off-site infrastructure.

10.3 Foul Drainage Maintenance and Management

The PTP and associated foul drainage network will be maintained to ensure effective operation over the lifetime of the development.

The PTP will be installed in accordance with the manufacturer's specifications and operated within its design capacity. Routine servicing will be undertaken by a competent contractor at intervals recommended by the manufacturer to ensure continued treatment performance.

Maintenance will include inspection of mechanical and electrical components, desludging at appropriate intervals, and verification that effluent quality meets the required discharge standards. The system will be designed to allow safe and straightforward access for inspection, maintenance and emptying.

The private foul drainage network serving the development will be subject to periodic inspection to identify any blockages, damage or operational issues. Inspection chambers will be provided at appropriate intervals to facilitate maintenance.

Responsibility for operation and maintenance will rest with the site owner. A maintenance regime will be implemented to ensure the system remains compliant with the General Binding Rules and continues to operate effectively.

The proposed approach provides a simple and robust foul drainage solution, with clear management responsibility and no reliance on third-party infrastructure.

11. Conclusions

This report has been prepared to support the discharge of Condition 10 relating to foul and surface water drainage for the proposed development at Land East of Coolham Road, West Chiltington.

A review of the site characteristics, including topography and site-specific infiltration testing, has informed the development of a proportionate and robust drainage strategy. BRE365 testing has confirmed that infiltration is not viable as a primary means of surface water disposal. The strategy has therefore been developed on the basis of attenuation and controlled discharge, in accordance with the SuDS hierarchy.

Surface water runoff from the proposed development area of approximately 700m² will be managed through permeable paving constructed over an open-graded sub-base. This provides interception, treatment and attenuation at source, with discharge restricted to the greenfield runoff rate (QBAR approximately 0.4l/s) prior to discharge to the existing ditch along the eastern boundary. The strategy follows the natural drainage pattern of the site and does not require pumped infrastructure or off-site upgrades.

Foul drainage will be managed via a package treatment plant sized appropriately for the proposed development. Treated effluent will discharge to the same eastern boundary ditch, which has been confirmed to contain water throughout the year and provides a suitable receiving environment. The system will operate within the requirements of the General Binding Rules and will be maintained in accordance with manufacturer guidance.

The proposed drainage strategy:

- Follows the SuDS hierarchy and reflects site-specific constraints
- Restricts runoff to greenfield rates and does not increase flood risk elsewhere
- Provides a clear and appropriate discharge route for both surface water and foul flows
- Incorporates simple, gravity-based systems with straightforward maintenance requirements

On this basis, the proposed drainage arrangements are considered suitable for the site and compliant with relevant national standards and local policy. The requirements of Condition 10 have been addressed, and the condition can be discharged.

Note:

This report has been prepared for the purposes of submitting for planning to the local planning authority for review, in relation to the associated SuDS for the proposed development and uses the most up-to-date information available to us at the time. It should not be relied upon by anyone else or used for any other purpose. This report is confidential to our Client; it should only be shown to others with their permission. We retain copyright of this report which should only be reproduced with our permission.

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.

	Prepared By	Checked By	Approved for issue
Name	Tom Quigg BSc MSc CEng MICE	Magaly Sedeño BA	Tom Quigg BSc MSc CEng MICE
Signature	TQ	MS	TQ
Date	20 May 2026	20 May 2026	20 May 2026

Appendix A - Development Proposals



Line/Hatch Key	
	Red Line Boundary
	Blue Line Boundary
	Existing Structures
	Existing Caravan
	Existing Hardstanding
	Existing Vegetaion Canopy
	Surveyed Trees
	Existing Grassland
	Boundary Fence
	Gated Access
	Proposed Mobile Home
	Proposed Native Hedge & Tree Planting
	Proposed Dayroom
	Proposed Loose Bound Permeable Hardstanding
	Proposed Foul Drain
	Proposed Package Mini-Package Treatment Plant

P01	Initial	P01	EG	02/09/2025
Issue ID	Transmittal	Current Revision	Initials	Date
	Issue Name			

Do not scale from this drawing except for planning application purposes. The contractor is to check all site dimensions, levels and sewer inverts before works commence. This drawing must be checked and read against any structural or specialist consultant drawings. The contractor is to comply in all respects with the current Building Regulations and BS Codes of Practice whether or not specifically stated on these drawings. This drawing is not intended to show details of foundations, ground conditions or ground contaminants and confirmation and/or investigation is to be carried out by suitable experts. This drawing and the building works/designs depicted are the copyright of Green Planning Studio Ltd and are not to be reproduced in any form or by any means without the written consent of Green Planning Studio Ltd.

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Client
Wayne Ward

Project
19_1022A Land East of Coolham Road - Land Use
Land East of Coolham Road,
Coolham Road,
West Chiltington,
West Sussex .
RH20 2LT

Drawing Title
Proposed Site Plan

Scale @A1 1:500	Date 02/09/2025	Drawn EG
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Case No 19_1022A	Status Initial Status
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DRAWING No 19_1022A-003	Rev P01
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ISO 19650 No:
19_1022A-GPS-ZZ-GF-DR-A-003

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Appendix B - Greenfield Run-Off Calculations

hrwallingford

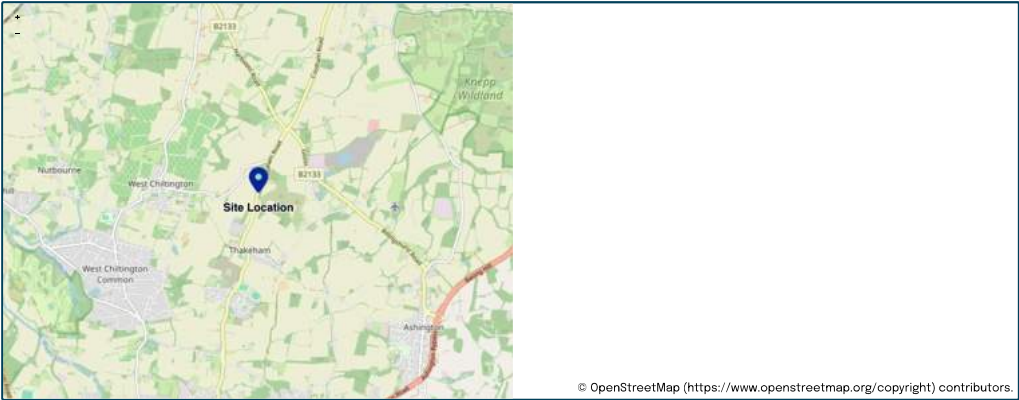
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	04/05/2026
Calculated by	TQ
Reference	Coolham Road
Model version	2.2.3

Location

Site name	Coolham Road
Site location	Chiltington



Site easting (British National Grid)	510611
Site northing (British National Grid)	118241

Site details

Total site area (ha)	0.07
----------------------	------

Greenfield runoff

Method

Method	IH124
--------	-------

IH124

My value	839	mm	Map value	839
SAAR (mm)				
How should SPR be derived?	WRAP soil type			
WRAP soil type	4			4
SPR	0.47			
QBar (IH124) (l/s)	0.4	l/s		

Growth curve factors

My value	7	Map value	7
Hydrological region			
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

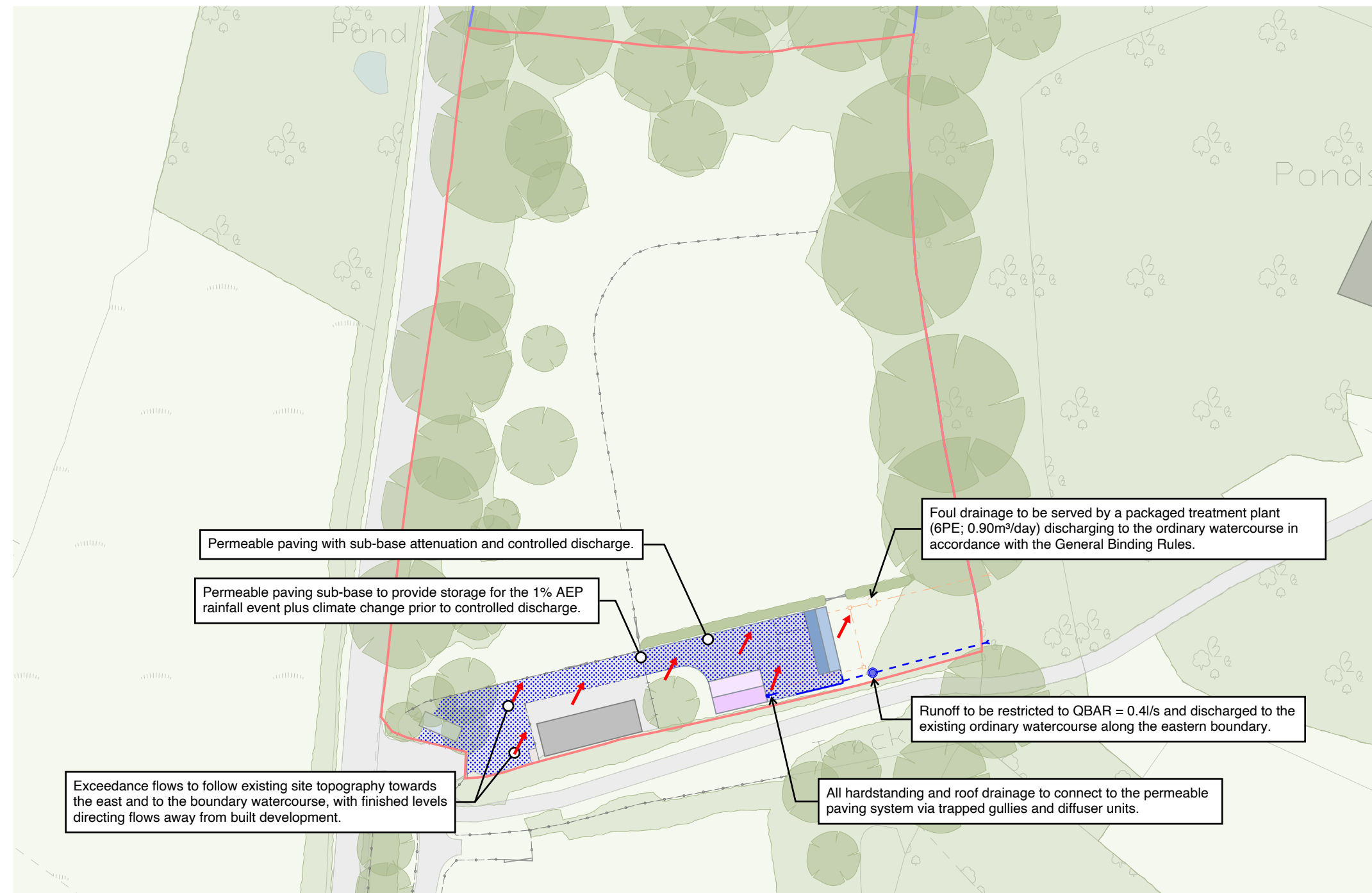
Method	IH124	
Flow rate 1 year (l/s)	0.4	l/s
Flow rate 2 year (l/s)	0.4	l/s
Flow rate 10 years (l/s)	0.7	l/s
Flow rate 30 years (l/s)	1.0	l/s
Flow rate 100 years (l/s)	1.3	l/s
Flow rate 200 years (l/s)	1.6	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksubs.com](https://www.uksubs.com/) (https://www.uksubs.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksubs.com/terms-conditions](https://www.uksubs.com/terms-conditions) (https://www.uksubs.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix C - SuDS Strategy



General

1. All drainage works shall be carried out in accordance with the approved drainage strategy and CIRIA C753 SuDS Manual and Non-Statutory Technical Standards for SuDS (2025).
2. The drainage system shall ensure no increase in flood risk on or off site.
3. All levels shown are indicative and shall be confirmed at detailed design stage.
4. The contractor shall verify ground levels and drainage arrangements prior to construction.
5. Any discrepancies shall be reported to the Engineer prior to works proceeding.

Surface Water Drainage

6. Surface water shall be managed via permeable paving over an open-graded granular sub-base.
7. The system shall provide interception, treatment, attenuation and conveyance at source.
8. The permeable construction shall comprise no-fines material (e.g. Type 3 or equivalent).
9. Materials containing fines (e.g. MOT Type 1, scalpings) shall not be used within permeable layers.
10. The sub-base shall provide adequate void storage to accommodate the design storm event.
11. The system is designed on the basis of no reliance on infiltration. Any infiltration shall be incidental only.
12. Surface water discharge shall be restricted to the greenfield runoff rate (QBAR 0.4l/s).
13. Flow control shall be provided via an appropriate control device or equivalent arrangement.
14. Surface water shall discharge to the ditch along the eastern boundary.
15. The outfall shall be designed to prevent erosion, scour or sediment mobilisation.

Roof Drainage

16. Roof runoff shall be directed into the permeable system via distributed connections.
17. Direct point discharge onto the surface shall be avoided.
18. Inlets shall include silt traps or equivalent measures where appropriate.

Exceedance and Overland Flow

19. Finished levels shall direct exceedance flows away from buildings.
20. Overland flow shall follow natural topography toward the eastern boundary ditch.
21. No ponding shall occur adjacent to structures.
22. Exceedance flows shall remain within site boundaries and not increase flood risk elsewhere.

Foul Drainage

23. Foul drainage shall discharge via a package treatment plant (minimum 6PE capacity).
24. The system shall comply with BS EN 12566 and manufacturer specifications.
25. Treated effluent shall discharge to the eastern boundary ditch.
26. Discharge shall comply with the General Binding Rules for small sewage discharges.
27. The outfall shall be set to ensure positive gravity discharge and avoid blockage or erosion.

Water Quality

28. The permeable paving system shall provide primary treatment via filtration and sediment capture.
29. No high-risk pollutant-generating uses are proposed on site.

Construction

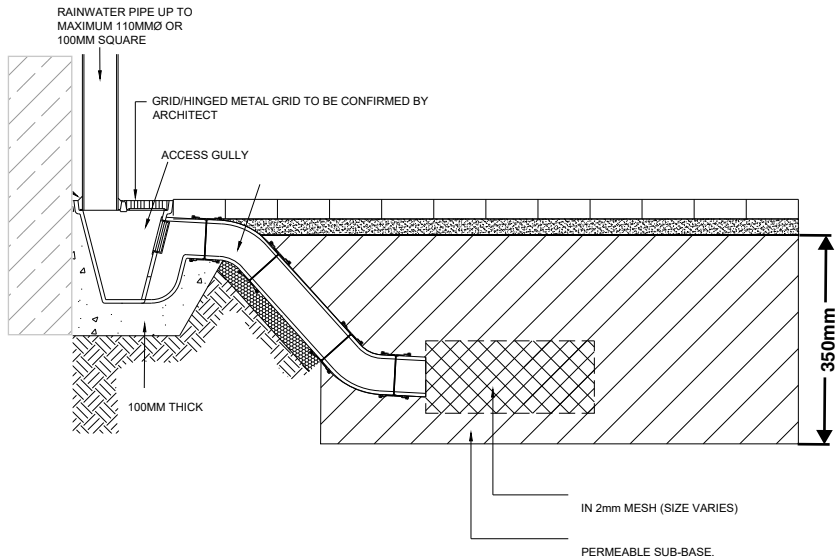
30. Temporary drainage measures shall be implemented to prevent sediment entering the ditch.
31. Permeable paving shall be protected from contamination during construction.
32. Sub-base materials shall not be trafficked or clogged with fines prior to completion.

Maintenance

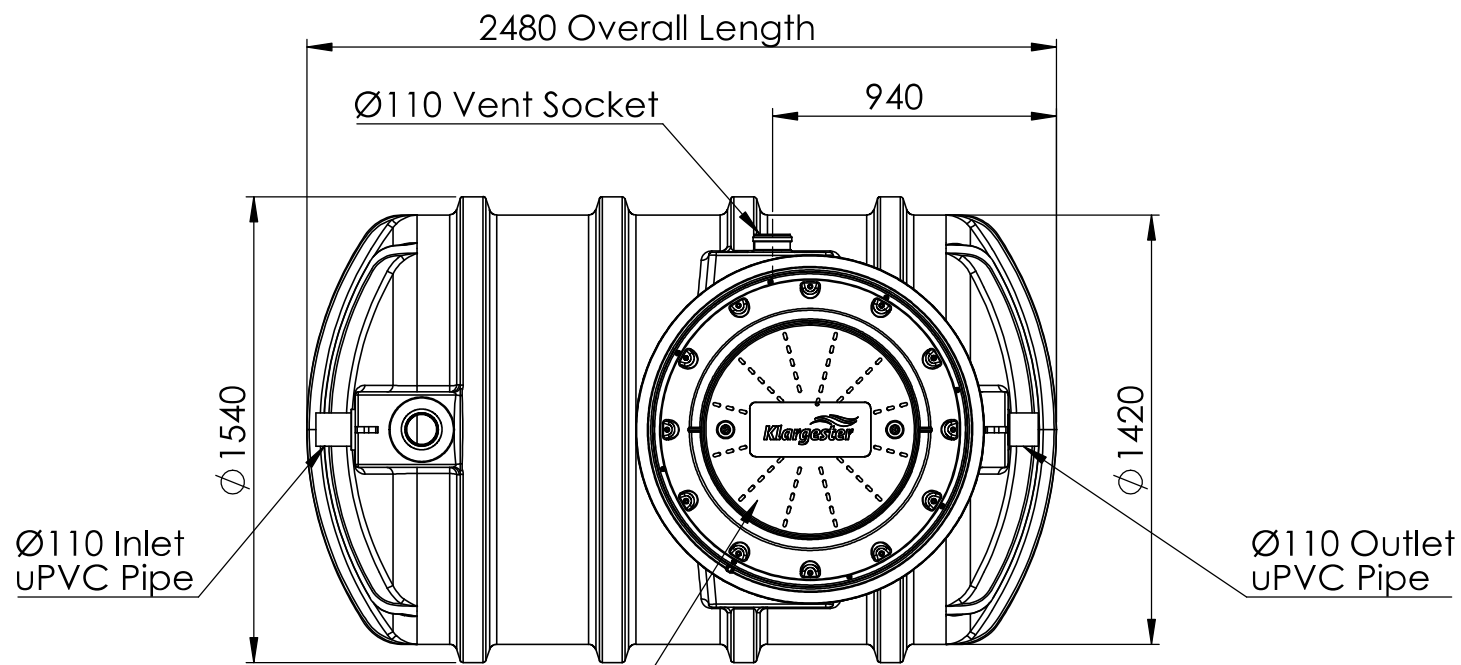
33. The drainage system shall be maintained by the site owner.
34. Permeable paving shall be inspected and swept as required to maintain permeability.
35. Inlets, outlets and control devices shall be inspected and kept clear of debris.
36. The PTP shall be serviced and desludged in accordance with manufacturer recommendations.

Consents

37. Any works affecting the ditch may require Ordinary Watercourse Consent from West Sussex County Council.
38. All necessary permissions and consents shall be obtained prior to construction.

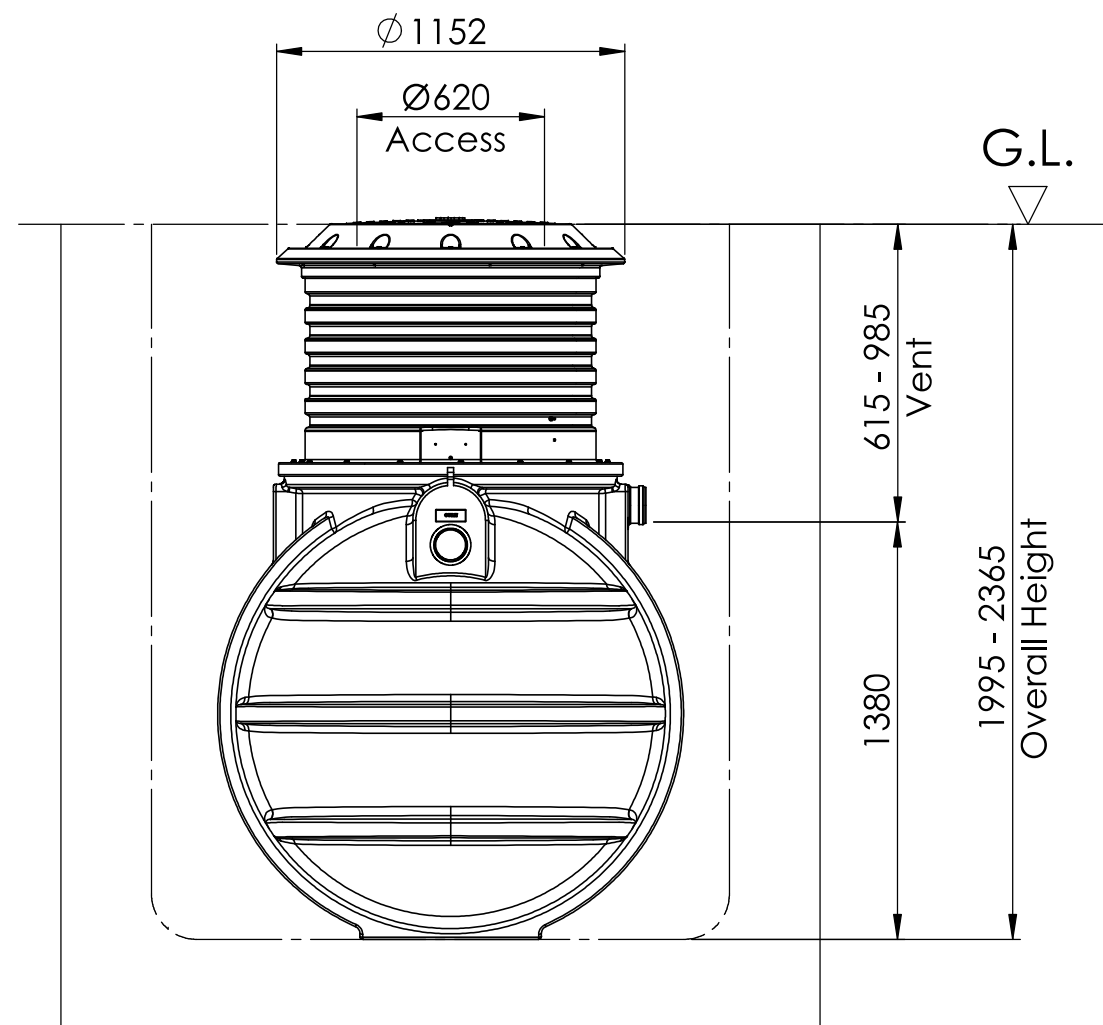
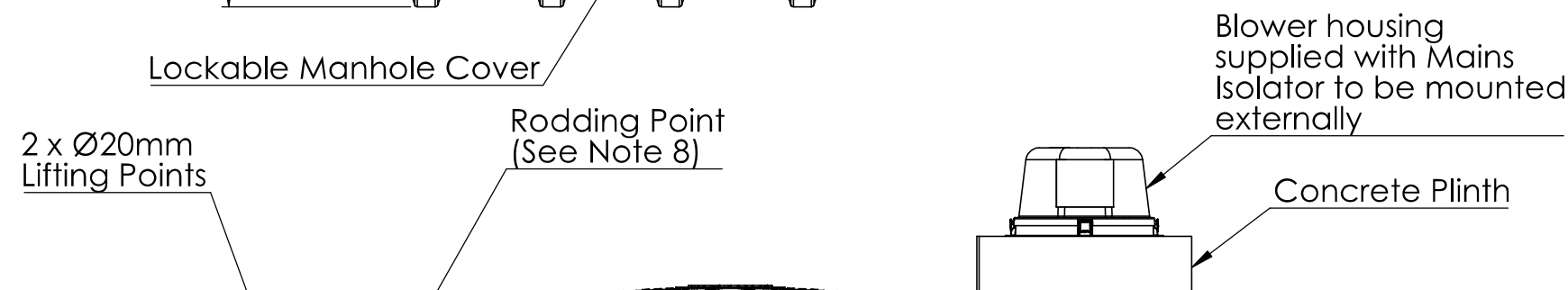


RAINWATER DOWNPIPE DETAIL FOR CONNECTION TO PERMEABLE PAVING



Notes :

1. Inlet and Outlet are Ø110 mm. Suitable reducers should be used to step down from bigger pipework. Supplied by others.
2. Units invert is adjustable by trimming external riser to required height. Selection of correct invert is key and must be suitable for drainage and ground levels on site.
3. Ext neck kit available for deeper inverts up to a maximum invert of 1430 mm. See extension neck drawing for assembly details.
4. It is important to read and understand installation operation and maintenance guidelines before attempting to install this unit.
5. Vent pipe connection is supplied but vent runs and stacks are supplied by others.
6. Air hose for tank internals is supplied with blower housing and is run through the vent.
7. Tank Weight (Empty) - 175 kg
8. Rodding point supplied by others. This needs to be finished at ground level. Standard 4" (Ø110 mm) drainage pipe and cap supplied by others.



Please check with Klargester for the latest Issue of the drawing				
Issue	Date	Drawn By	Approved By	Description
06	13/06/2025	D.Musvaburi	D.M	ECN 2214 - Capping the Ø200 stilling pipe on BioTec+
05	14/04/2025	D.Musvaburi	D.M	ECN 2170 - Adaptor added

LN Number :
Finish :
Weight :
Modelled By :

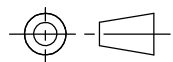
Tolerance (unless stated) :
Thickness :
Surface Area : m²
Material :

Drawing : DS1473P

Page 1 of 1

BioTec+2 Gravity Sales Drawing

All Dimensions In mm Scale: Do Not Scale



Third Angle Projection

A:\Wastewater\Engineering\Drawing Data\02 - Sales Drawings\DS\DS - 14\DS1473P

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Wastewater Treatment Solutions

Klargester

BioTec+ Sewage Treatment Plant

The BioTec+ is the newest addition to our sewage treatment plant portfolio. Our most economically priced plant in the range offers customers all the benefits of a Klargester product without the price tag. With flexible installation options to suit a variety of domestic sites, low visual footprint and suitable for shallow dig applications, the Klargester BioTec+ is a cost-efficient choice for your domestic wastewater treatment solution.

3.5mg/l
phosphate

Total P
Removal
60.8%

TNb
75.5%
15mg/l
nitrate



KNECT PRO
POWERED BY
SMART MONITORING

With Klargester, your BioTec+ is monitored, serviced and cared for by the experts who know it best, giving you total peace of mind.

*Terms and conditions apply. View online at:
<https://water.kwe.kingspan.com/warranty>

klargester.co.uk

How it Works



Stage 1:

Crude sewage enters the system through an inlet pipe on the side of the BioTec+.



Stage 2:

Compressed air comes from the blower to the diffuser leg through a cable duct. Sewage is aerated via a diffuser at the bottom of the reactor. 8 min ON / 2 min OFF / 9H Total.



Stage 3:

Naturally occurring micro-organisms form part of this aerated mixture and will efficiently break down the pollutants in the sewage.



Stage 4:

After 9 hours, aeration stops and solids will settle in the bottom of the tank. Clearwater removal is airlifted from the tank to the outlet pipe.



Product Features

98.5%

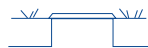
Improved effluent
quality – BOD₅
98.5%



EN 12566-3



Easy to install
and operate



Low Profile
Cover



Lightweight no
crane needed



Low running
costs

Specifications

BioTec+	Model	BioTec+ 2	BioTec+ 3	BioTec+ 4	BioTec+ 5	BioTec+ 6	BioTec+ 7	BioTec+ 8	BioTec+ 9
Population Equivalent	Unit	6	9	12	16	20	25	35	50
Daily Flow Q ₁₀	m ³ /d	0.90	1.35	1.80	2.40	3.00	3.75	5.25	7.50
Daily Load	kg BOD ₅ /d	0.36	0.54	0.72	0.96	1.20	1.50	2.10	3.00
Daily Flow Q ₁₀	m ³ /h	0.09	0.135	0.18	0.24	0.3	0.375	0.525	0.75
Measurements									
Inlet invert (Gravity / IPS)	mm	645-1430/ 845-1430	730-1420/ 930 -1420	500-2000/ 1000-2000	500-2000/ 1000-2000	500-2000	500-2000	500-2000	500-2000
Discharge Option		Gravity/IPS	Gravity/IPS	Gravity/IPS	Gravity/IPS	Gravity	Gravity	Gravity	Gravity
Outlet Invert (Gravity / IPS)	mm	745-1500/ 580-1165	830-1520/ 580-1070	600-2100/ 500	600-2100/ 500	600-2100	600-2100	600-2100	600-2100
Diameter	mm	1540	1690	1420	1920	1920	1920	1920	1920
Length	mm	2480	2480	4274	3238	3963	4752	6640	9315
Installation Depth	mm	1995-2780/ 2195-2780	2250-2940/ 2450-2940	1835-3335/ 2335-3335	2250-3750/ 2750-3750	2250-3750	2250-3750	2250-3750	2250-3750
Inlet Pipework	mm	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø160	Ø160
Outlet Pipework (Gravity / IPS)	mm	Ø110/Ø50	Ø110/Ø50	Ø110/Ø50	Ø110/Ø50	Ø110	Ø110	Ø160	Ø160
Material Construction	MDPE/GRP	MDPE	MDPE	GRP	GRP	GRP	GRP	GRP	GRP
Unit Weight	kg	175/185	195/210	260/290*	350/360*	405	460	690	890

*Tank weight based on 500mm invert



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any of our products: GB:
T: +44 (0) 1296 633 033
E: klargest@kingspan.com
W: klargest.co.uk

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Appendix D - Hydraulic Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	999.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)	Invert Level (m)
Permeable Paving	0.070	5.00	0.500	450	0.500	0.000
Outfall	0.000		0.500	450	0.500	0.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Permeable Paving	Outfall	3.000	0.600	0.000	0.000	0.000	0.0	100	5.05	54.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.000	7.9	13.8	0.400	0.400	0.070	0.0	100	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	3.000	0.0	100	Circular	0.500	0.000	0.400	0.500	0.000	0.400

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Permeable Paving	450	Manhole	Adoptable	Outfall	450	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Permeable Paving	0.500	0.500	450				
					0	1.000	100
Outfall	0.500	0.500	450		1	1.000	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	1440
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	0	0

Node Permeable Paving Online Depth/Flow Control

Flap Valve x | Replaces Downstream Link ✓ | Invert Level (m) 0.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	0.400	0.500	0.400

Node Permeable Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	0.000	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	810	Depth (m)	0.350
Safety Factor	2.0	Width (m)	26.460	Inf Depth (m)	0.350
Porosity	0.30	Length (m)	26.460		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 15 minute summer	488.233	138.153
100 year +40% CC 15 minute winter	342.620	138.153
100 year +40% CC 30 minute summer	320.551	90.705
100 year +40% CC 30 minute winter	224.948	90.705
100 year +40% CC 60 minute summer	214.603	56.713
100 year +40% CC 60 minute winter	142.577	56.713
100 year +40% CC 120 minute summer	129.587	34.246
100 year +40% CC 120 minute winter	86.094	34.246
100 year +40% CC 180 minute summer	97.729	25.149
100 year +40% CC 180 minute winter	63.526	25.149
100 year +40% CC 240 minute summer	75.977	20.078
100 year +40% CC 240 minute winter	50.477	20.078
100 year +40% CC 360 minute summer	56.677	14.585
100 year +40% CC 360 minute winter	36.841	14.585
100 year +40% CC 480 minute summer	43.979	11.622
100 year +40% CC 480 minute winter	29.219	11.622
100 year +40% CC 600 minute summer	35.604	9.738
100 year +40% CC 600 minute winter	24.327	9.738
100 year +40% CC 720 minute summer	31.433	8.424

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 720 minute winter	21.125	8.424
100 year +40% CC 960 minute summer	25.432	6.697
100 year +40% CC 960 minute winter	16.847	6.697
100 year +40% CC 1440 minute summer	18.055	4.839
100 year +40% CC 1440 minute winter	12.134	4.839
100 year +40% CC 2160 minute summer	12.630	3.490
100 year +40% CC 2160 minute winter	8.702	3.490
100 year +40% CC 2880 minute summer	10.319	2.766
100 year +40% CC 2880 minute winter	6.935	2.766
100 year +40% CC 4320 minute summer	7.609	1.989
100 year +40% CC 4320 minute winter	5.011	1.989
100 year +40% CC 5760 minute summer	6.145	1.573
100 year +40% CC 5760 minute winter	3.978	1.573
100 year +40% CC 7200 minute summer	5.137	1.311
100 year +40% CC 7200 minute winter	3.316	1.311
100 year +40% CC 8640 minute summer	4.424	1.129
100 year +40% CC 8640 minute winter	2.855	1.129
100 year +40% CC 10080 minute summer	3.897	0.994
100 year +40% CC 10080 minute winter	2.515	0.994

Results for 100 year +40% CC 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
600 minute winter	Permeable Paving	585	0.272	0.272	4.7	53.9288	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.000	0.000	0.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link Depth/Flow	DS Node	Outflow (l/s)	Discharge Vol (m³)
600 minute winter	Permeable Paving	Depth/Flow	Outfall	0.4	48.4

Appendix E - Ground Investigation - Infiltration Testing



26/04/2026

Our ref: ICE0621/LD01/260426

Mr. Wayne Ward

Dear Wayne,

RE: Land East of Coolham Road, West Chiltington, West Sussex, RH20 2LT – BRE 365 Soakage Testing

We are pleased to present the results of the soakage testing undertaken at the above site. The soakage tests were undertaken in general accordance with BRE Digest 365 'Soakaway Design' BRE, 2016.

The intrusive investigation was undertaken on the 23rd April 2026, with the works supervised by an IBEX Engineer.

Background

The site is understood to be occupied by an open undeveloped parcel of land. Published geological records indicate that the ground conditions are likely to comprise the Head Deposits overlying mudstone of the Weald Clay Formation. A thickness of Made Ground or Topsoil is also anticipated over the natural deposits.

Scope of Site Works

Two machine excavated trial pits were excavated to a maximum depth of 2.50m bgl and two soakage tests in general accordance with BRE Digest 365 were undertaken within the trial pits SA01 and SA02.

Ground Conditions

The ground conditions encountered were broadly consistent with those anticipated, namely a thickness of Topsoil overlying the Head Deposits over the Weald Clay Formation.

For further details of the ground conditions, reference should be made to the exploratory hole logs presented in Appendix A.

Groundwater

Groundwater was not encountered during the investigation.

Soakaways

Table 1 summarises the soakage rates, which were calculated based on the results of the soakage testing:

Reference	Geology	Calculated Infiltration Rates (m/s)		
		1 st Cycle	2 nd Cycle	3 rd Cycle
SA01	Head Deposits	N/D	N/D	N/D
SA02	Weald Clay Formation	N/D	N/D	N/D

N/D: Not determined due to insufficient fall in head over a single-day period.

Table 1 Summary of Soakage Test Results

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Geotechnical and Environmental Specialists | Site Investigations

IBEX Consulting Engineers Limited registered in England and Wales under the company registration number: 13585544

Closure

We trust that we have interpreted your instructions correctly; please do not hesitate to contact us should you have any queries.

Yours sincerely

For and on Behalf of IBEX Consulting Engineers Limited



**Levent Dogan BSc, MSc, PGDip, CEng MCIHT, AMICE, AMIEnvSc
Director**

levent.dogan@ibexconsultant.com

Enc.	Figure 1	Site Location Plan
	Figure 2	Exploratory Hole Logs Location Plan
	Appendix A	Exploratory Hole Logs
	Appendix B	BRE 365 Soakage Testing Results



Figures





Project:	Land East of Coolham Road, West Chiltington, West Sussex, RH20 2LT			Title	Site Location Plan	
Client:	Mr. Wayne Ward			IBEX Consulting Engineers Limited Abbey House, 25 Clarendon Road Redhill, Surrey. RH1 1QZ +44(0)1737 452622 www.ibexconsultant.com 		
Ref No:	ICE0621	Revision:	0			
Drawn:	LD	Date:	26/04/2026			
Figure:	1	Scale:	Not To Scale			



Project:	Land East of Coolham Road, West Chiltington, West Sussex, RH20 2LT			Title	Exploratory Hole Logs Location Plan	
Client:	Mr. Wayne Ward			IBEX Consulting Engineers Limited Abbey House, 25 Clarendon Road Redhill, Surrey. RH1 1QZ +44(0)1737 452622 www.ibexconsultant.com 		
Ref No:	ICE0621	Revision:	0			
Drawn:	LD	Date:	26/04/2026			
Figure:	2	Scale:	Not To Scale			

Appendix A

Exploratory Hole Logs



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Key to exploratory hole symbols and abbreviations

SAMPLE TYPES

ACM - Asbestos sample	AMAL - Amalgamated sample	B - Bulk disturbed sample
BLK - Block sample	C - Core sample	CBR - CBR test sample
D - Disturbed sample	ES - Environmental sample	EW - Environmental water sample
G - Gas sample	J - Jar sample	L - Liner sample
TW - Pushed thin wall sample	U - Undisturbed sample	UT - Undisturbed thin wall sample
W - Water sample		

IN-SITU TESTS

HV - Hand shear vane	HV(r) - Hand shear vane residual	PID - Photo ionisation detector
PP - Hand penetrometer	SPT - Standard penetration test	SPT(C) - SPT using cone

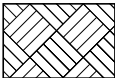
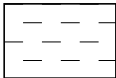
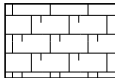
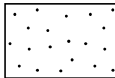
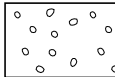
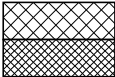
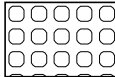
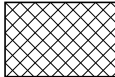
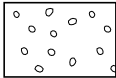
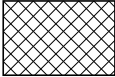
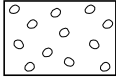
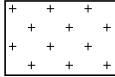
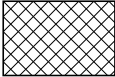
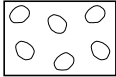
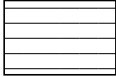
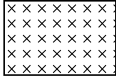
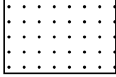
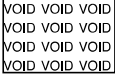
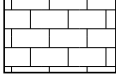
GROUNDWATER

 Groundwater strike	 Groundwater rest level
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ROTARY CORE DETAILS

TCR - Total core recovery (%)	SCR - Solid core recovery (%)	RQD - Rock quality designation (%)
FI - Fracture index	NI - Non-intact core	AZCL - Assumed zone of core loss

LEGEND

 Topsoil	 Clay	 Chalk	 Sand backfill
 Peat	 Silt	 Breccia	 Gravel backfill
 Made ground [cohesive]	 Sand	 Conglomerate	 Arisings
 Concrete	 Gravel	 Metamorphic	 Bentonite
 Wood	 Cobbles	 Igneous	 Concrete
 Brick	 Boulders		 Grout
 Bituminous material	 Mudstone		 Plain pipe
 Gypsum	 Siltstone		
 Coal	 Sandstone		 Slotted pipe
 VOID VOID VOID VOID VOID VOID VOID VOID VOID VOID VOID VOID	 Limestone		



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Borehole Log

SA01

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale 1:50
Project Name Land East of Coolham Road, West Chiltington	Project No. ICE0621	Start Date 2026-04-23	End Date 2026-04-23	

Client Mr. Wayne Ward	Consultant LD	Contractor
--------------------------	------------------	------------

Inst/ Backfill	Water Levels	Samples and Tests		Level (m)	Depth (m)	Strata		
		Depth (m)	Type/ Ref			Legend	Description	
					(0.30)		Grass over brown sandy silty clay. [TOPSOIL]	
					0.30			
							Light brown greenish grey mottled silty CLAY with black flecks. [Head Deposits]	0.5
					(1.20)			1.0
								1.5
					1.50		End of Borehole at 1.50m	1.5
								2.0
								2.5
								3.0
								3.5
								4.0
								4.5
								5.0
								5.5
								6.0
								6.5
								7.0
								7.5
								8.0
								8.5
								9.0
								9.5
								10.0

Remarks 1. Soakage test undertaken. 2. Pit remained dry and backfilled with arisings on completion.	Method, Plant, Stability, Dimensions 0.00 - 1.50m TP Mini digger Stable L = 1.50m W = 0.35m	Logger LD
---	---	--------------



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Borehole Log

SA02

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale 1:50
Project Name Land East of Coolham Road, West Chiltington	Project No. ICE0621	Start Date 2026-04-23	End Date 2026-04-23	

Client Mr. Wayne Ward	Consultant LD	Contractor
--------------------------	------------------	------------

Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (thickness) (m)	Strata						
		Depth (m)	Type/ Ref	Results			Legend	Description					
						(0.21) 0.21		Grass over brown sandy silty clay with roots. [TOPSOIL]	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0				
							Light brown greenish grey mottled silty CLAY with black flecks. [Head Deposits]						
						(1.49)							
						1.70		Bluish grey silty CLAY. [Weald Clay Formation]					
						(0.80)							
						2.50							
						End of Borehole at 2.50m							

Remarks 1. Soakage test undertaken. 2. Pit remained dry and backfilled with arisings on completion.	Method, Plant, Stability, Dimensions 0.00 - 2.50m TP Mini digger Stable L = 1.50m W = 0.35m	Logger LD
---	---	--------------

Appendix B

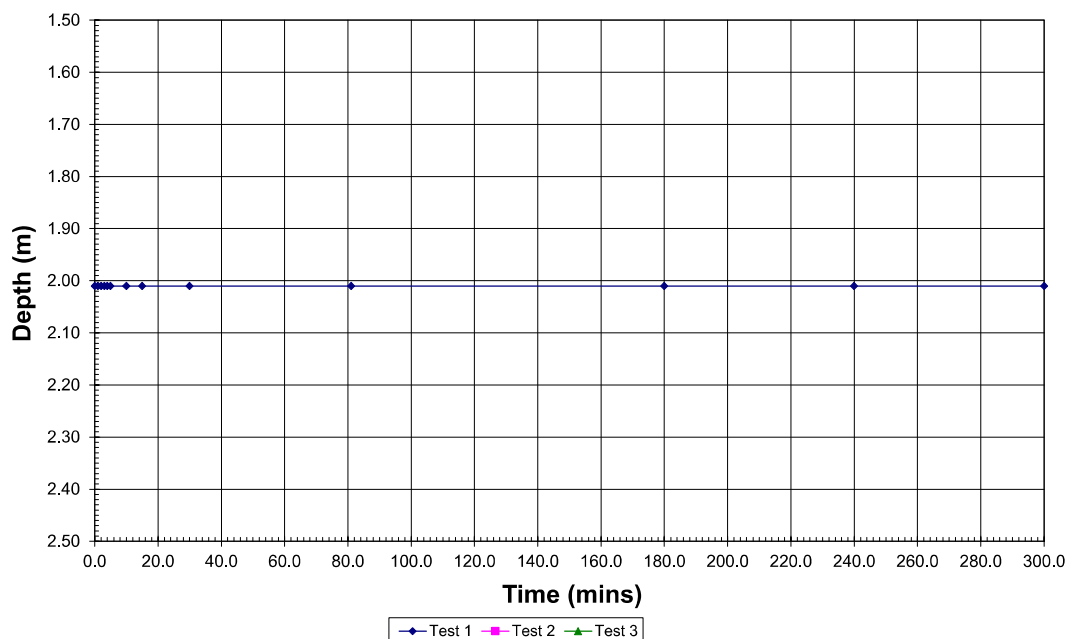
BRE 365 Soakage Testing Results



Project Name :	Land East of Coolham Road, West Chiltington, West Sussex, RH20 2LT	Job No. :	ICE0621
Client :	Mr. Wayne Ward	Date :	26/04/2026

Pit reference	SA02
Pit depth (m)	2.50
Pit width (m)	0.35
Pit length (m)	1.50
Depth to standing water (m)	

Test 1	
Time (min)	Depth (m)
0.0	2.01
1.0	2.01
2.0	2.01
3.0	2.01
4.0	2.01
5.0	2.01
10.0	2.01
15.0	2.01
30.0	2.01
81.0	2.01
180.0	2.01
240.0	2.01
300.0	2.01

[illegible][illegible]

Max. depth (m)	2.50	2.50	2.50
Effective depth (m)	0.49	2.50	2.50
75% effective depth (m)	2.13	0.63	0.63
50% effective depth (m)	2.26	1.25	1.25
25% effective depth (m)	2.38	1.88	1.88
t75 (min)			
t50 (min)			
t25 (min)			
Vp 75-25	0.13	0.66	0.66
ap 50	1.4315	5.15	5.15
tp 75-25	0.00	0.00	0.00

Soil infiltration rate (m/s)	#DIV/0!	#DIV/0!	#DIV/0!
Soil infiltration rate (mm/hr)	#DIV/0!	#DIV/0!	#DIV/0!

Notes:

- | | |
|---|--|
| 1 | Orange cells require input data |
| 2 | Infiltration calculated to method in 'BRE Digest 365 (1991) - Soakaway Design' |
| 3 | First line of table must be depth at time = 0 |