



Land South of Floran Farm

Surface and Foul Water Drainage Strategy

Job Number: 1735

Date	Version	Notes/Amendments
April 2026	1	Issued for Information

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Figure 1. Site Location

Figure 2. Sewer Records - Southern Water

Acronym	Definition
AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BRE	Building Research Establishment
CIRIA	Construction Industry Research and Information Association
GBR	General Binding Rules
LLFA	Lead Local Flood Authority
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
PTP	Package Treatment Plant
QBAR	Mean Annual Flood Flow Rate
SuDS	Sustainable Drainage Systems
WSCC	West Sussex County Council

Executive Summary

This Surface Water and Foul Water Drainage Strategy has been prepared in support of a planning application for the proposed residential development of nine dwellings at Land south of Floran Farm, Hophurst Hill, Crawley Down.

The site comprises an existing area of previously developed and hardstanding land within the wider Floran Farm holding. The site is not served by public foul water or surface water sewers and therefore requires private drainage solutions for both surface water and foul water management.

Surface water runoff from the proposed development will be managed through on-site attenuation and controlled discharge to the existing private drainage network serving the wider landholding. The proposed drained impermeable area is approximately 1,550m². Runoff will be attenuated within a cellular storage system sized for the 1 in 100-year rainfall event plus 40% climate change and discharged via a flow control chamber restricted to 2.9l/s, equivalent to the calculated QBAR greenfield runoff rate. This provides a clear betterment over the existing drainage regime by reducing peak runoff rates and likely reducing runoff volumes from the current hardstanding-dominated site.

Foul water drainage will be managed via a communal Klargester BioTec+ 9 package treatment plant serving all nine dwellings. Treated effluent will discharge to the existing private drainage network / watercourse. Based on an assumed occupancy of 33 persons and a design flow of 150l/person/day, the estimated foul discharge is 4.95m³/day, which remains below the 5m³/day threshold for discharge to surface water under the Environment Agency General Binding Rules.

All drainage infrastructure will remain private and will be maintained through a communal management arrangement secured through the legal agreements and conveyancing documentation for the development.

The proposed drainage strategy follows the Sustainable Drainage Systems (SuDS) hierarchy, utilises existing private drainage infrastructure and provides a practical, policy-compliant and deliverable solution for the development.

WSCC Surface Water Drainage Proforma

No.	Requirement	Answer
1.1	Address including postcode	Land south of Floran Farm, Hophurst Hill, Crawley Down, West Sussex, RH10 4LP
1.2	OS grid reference (easting and northing)	TQ 35847 38596
1.3	Planning application reference	Pending
1.4	Total site area (hectares)	0.4998ha
1.5	Pre-development use	Existing previously developed land comprising buildings, yard and hardstanding associated with Floran Farm
1.6	Proposed design life	100 years
1.7	Have agreements in principle for discharge been provided	YES (private drainage route within applicant ownership)
1.8	Topographic Survey Plan showing existing site layout, site levels and drainage system	Provided
2.1	Store rainwater for later use (reuse)	NO
2.2	Infiltration techniques such as soakaways, permeable paving, etc	NO
2.3	Hybrid	NO
2.4	Attenuation with restricted discharge to watercourse	YES – attenuation with restricted discharge to existing private drainage network discharging to downstream watercourse
2.5	Attenuation with restricted discharge to surface water sewer	NO
2.6	Attenuation with restricted discharge to combined sewer	NO
3.1	Area within site which is drained by SuDS (hectares)	0.155ha
3.2	Impermeable area drained pre-development (hectares)	Existing brownfield hardstanding site, approximately equal to or greater than proposed impermeable area
3.3	Impermeable area drained post-development (hectares)	0.155ha
3.4	Urban Creep (hectares)	Included within design allowance where applicable
3.5	Climate change factor applied (1 in 30 and 1 in 100)	40%
4.1	Has winter groundwater monitoring and infiltration been undertaken	NO
4.2	Period of winter groundwater monitoring (from/to)	N/A
4.3	Depth to highest recorded groundwater level (mAOD)	N/A
4.4	Infiltration rate	N/A

No.	Requirement	Answer
4.5	Depth of infiltration structure (mAOD)	N/A
4.6	Safety factor used for sizing infiltration storage	N/A
5.1	Qbar (l/s)	2.9l/s
5.2	1 in 1 year rainfall (l/s)	2.5l/s
5.3	1 in 30 year rainfall (l/s)	6.7l/s
5.4	1 in 100 year rainfall (l/s)	9.3l/s
6.1	1 in 1 year rainfall (brownfield)	Existing unrestricted runoff exceeds proposed controlled discharge
6.2	1 in 30 year rainfall (brownfield)	Existing unrestricted runoff exceeds proposed controlled discharge
6.3	1 in 100 year rainfall (brownfield)	Existing unrestricted runoff exceeds proposed controlled discharge
7.1	Infiltration (m ³)	0m ³
7.2	Attenuation (m ³)	55m ³
7.3	Separate volume designated as long-term storage (m ³)	Included within attenuation strategy
7.4	Total volume control (sum of inputs for 7.1 to 7.3) (m ³)	55m ³
8.1	Proposed discharge rate (1 in 1 AEP)	2.9l/s
8.1	Proposed discharge rate (1 in 30 AEP)	2.9l/s
8.1	Proposed discharge rate (1 in 30 AEP plus climate change)	2.9l/s
8.1	Proposed discharge rate (1 in 100 AEP)	2.9l/s
8.1	Proposed discharge rate (1 in 100 AEP plus climate change)	2.9l/s
8.2	Calculations show critical storm durations can be accommodated on site	YES
8.3	Has treatment of potential contaminants been considered	YES
8.4	Demonstration of source control features with substantive evidence	YES
8.5	Existing system assessed for downstream discharge	YES
9.1	Plan detailing location of groundwater monitoring and infiltration testing	N/A
9.2	Detailed drainage design layout	Provided
9.3	Maintenance strategy	Provided
9.4	Detailed development layout	Provided

No.	Requirement	Answer
9.5	Impermeable area plan	Provided
9.6	Phasing plan	Not required at planning stage
9.7	If ground levels are raised over 300mm above existing levels	No significant raising proposed
—	Form completed by	Tom Quigg
—	Qualification of person responsible for signing off this proforma	BSc MSc CEng MICE
—	Company	Flume Consulting Engineers Ltd
—	On behalf of	WS Planning & Architecture / Client

1. Introduction

This Surface Water and Foul Water Drainage Strategy has been prepared by Flume Consulting Engineers Ltd in support of a planning application for the proposed residential development at Land south of Floran Farm, Hophurst Hill, Crawley Down, centred on Ordnance Survey Grid Reference TQ 35847 38596.

The proposed development comprises nine residential dwellings with associated access roads, parking areas, private amenity space and landscaping works.

The purpose of this report is to define an appropriate surface water and foul water drainage strategy for the proposed development and to demonstrate that the site can be drained in a sustainable and policy-compliant manner without increasing flood risk on-site or elsewhere.

The site is located within a rural area and is not served by public foul water or surface water sewers. A private drainage solution is therefore required for both surface water and foul water management. This report considers the existing site characteristics, including topography, geology, drainage constraints and existing drainage arrangements, and sets out a strategy developed in accordance with the Sustainable Drainage Systems (SuDS) hierarchy.

The level of detail presented is proportionate to the planning stage and is intended to demonstrate the feasibility of a deliverable drainage solution. Detailed design, final hydraulic sizing, treatment plant specification and verification of drainage connections will be undertaken at the subsequent design stage where required to support planning conditions and technical approval.

This report has been prepared with reference to the following guidance:

- National Planning Policy Framework
- Planning Practice Guidance (PPG): Flood Risk and Coastal Change
- National Standards for SuDS (2025)
- CIRIA C753 – The SuDS Manual (2015)
- Building Regulations Part H – Drainage and Waste Disposal
- Environment Agency – General Binding Rules for Small Sewage Discharges

2. Site Description and Location

The application site is located at Land south of Floran Farm, Hophurst Hill, Crawley Down, centred on Ordnance Survey Grid Reference TQ 35847 38596. The site forms part of a wider landholding associated with Floran Farm and comprises an existing parcel of previously developed and hardstanding land situated to the east of Hophurst Hill.

The red line planning boundary extends to approximately 0.4998ha and includes existing buildings, hardstanding areas and access arrangements. The site is accessed from Hophurst Hill via an existing entrance. The wider blue line boundary extends beyond the application site and comprises additional land under the applicant's control.

The surrounding area is rural in character, comprising agricultural land, woodland and dispersed residential properties associated with the wider farmstead and neighbouring holdings. Floran Farm is located immediately to the north of the site, with additional farm buildings and residential properties in the vicinity.

Topographically, the site generally falls from the south towards the north, with ground levels across the site ranging from approximately 100m AOD to 108m AOD. Localised variations in levels are present across the existing yard and building areas.

Published geological mapping indicates that the site is underlain by Upper Tunbridge Wells Sand Formation bedrock, comprising interbedded sandstone and siltstone. No superficial deposits are mapped across the site.

No defined watercourses are present within the application site. Review of available mapping and site information confirms that the site is served by an existing private drainage network associated with the wider landholding, including a large diameter drainage route to the north of the site which provides the existing downstream discharge route.

There are no public foul water or surface water sewers located within the vicinity of the site. The development therefore cannot connect to a public drainage network and requires private drainage solutions for both surface water and foul water disposal.

The site location and context are illustrated on Figure 1.

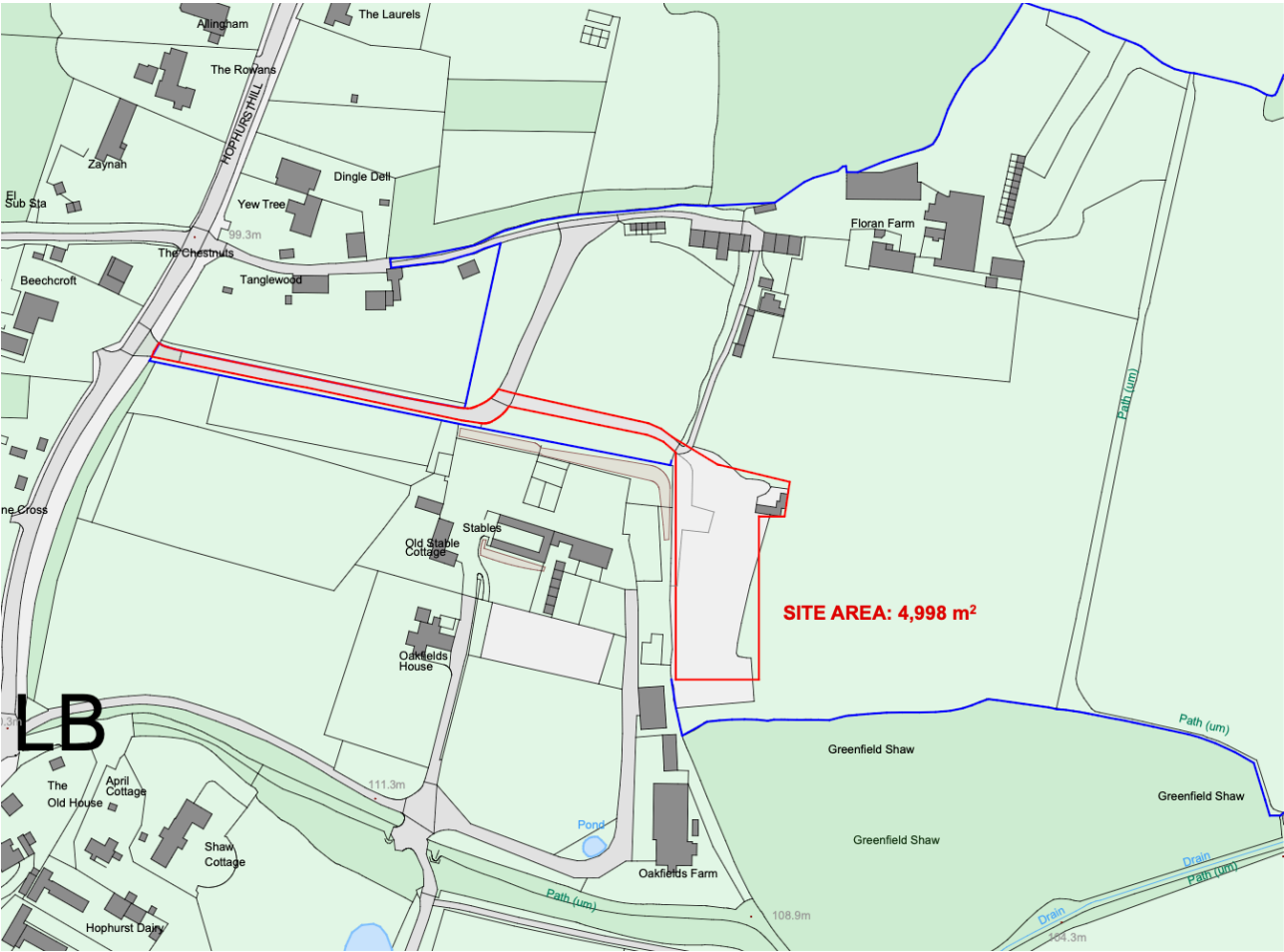


FIGURE 1. SITE LOCATION

3. Existing Drainage Conditions

The application site comprises an existing area of hardstanding and previously developed land with established private drainage infrastructure serving the wider Floran Farm holding. The site is not connected to any public foul water or surface water sewer network.

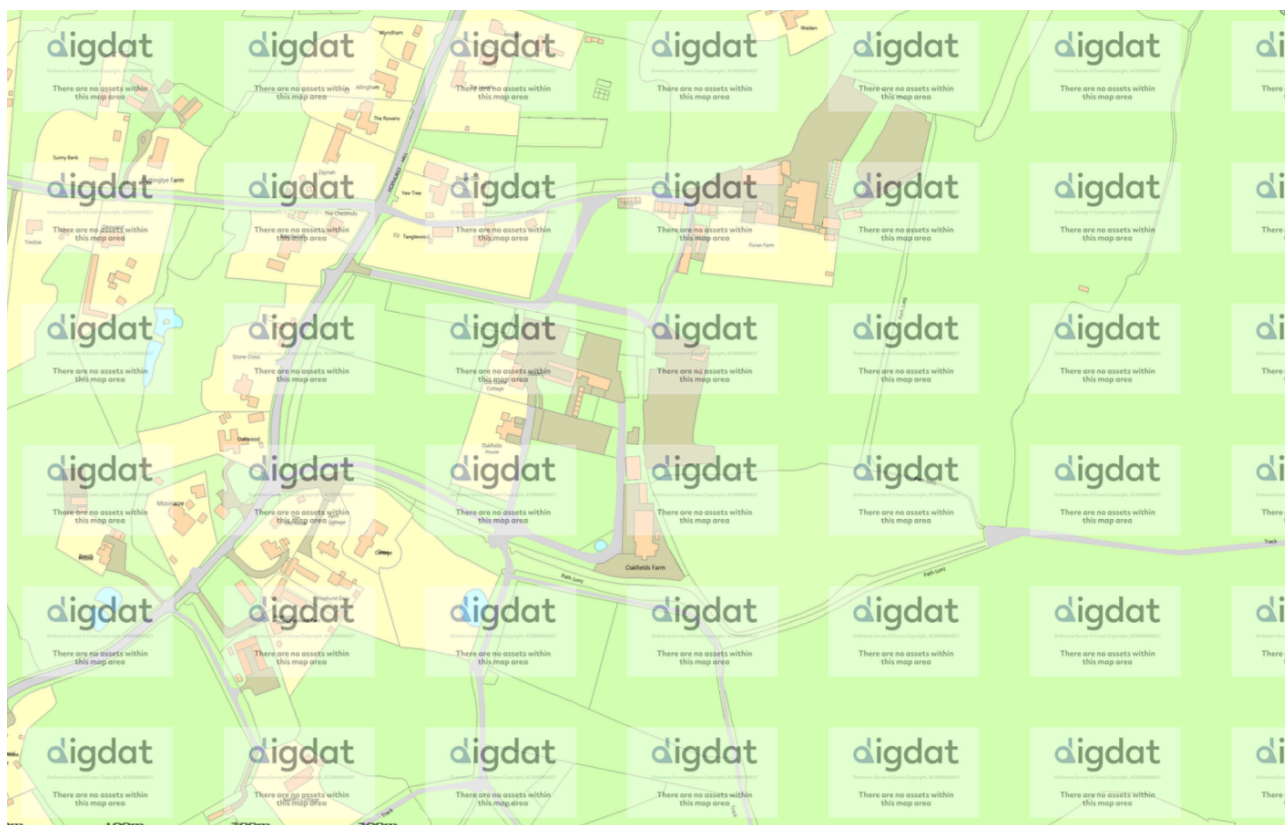
Surface water runoff from the existing site is understood to discharge to the private drainage network, which includes a large diameter drainage route located to the north of the application site. This network provides the existing downstream discharge route for the wider landholding. Given the extent of existing hardstanding and buildings, the current drainage regime is considered to generate relatively unrestricted runoff compared to a greenfield condition.

The proposed development area includes approximately 1,550m² of drained impermeable area associated with roofs, access roads, parking and hardstanding. Although the site is already substantially hardstanding in nature, the proposed redevelopment provides an opportunity to formalise the drainage arrangement and reduce runoff rates through attenuation and controlled discharge.

Published geological mapping indicates that the site is underlain by Upper Tunbridge Wells Sand Formation bedrock with no superficial deposits present. While some localised infiltration may occur, infiltration testing has not been undertaken and infiltration is not relied upon as the primary drainage mechanism.

There are no defined watercourses within the red line boundary. The foul water and surface water strategy has therefore been developed around the existing private drainage network and associated discharge route rather than reliance on new off-site connections.

The existing drainage regime is therefore characterised by private drainage infrastructure serving a previously developed site, with the proposed development providing a clear opportunity to improve runoff control and deliver betterment through reduced peak discharge rates and improved management of both surface water and foul water flows.



4. Development Proposals

The proposed development comprises the construction of nine residential dwellings together with associated access roads, parking areas, private amenity space and landscaping works.

The development will replace the existing arrangement of buildings, storage areas and hardstanding with a planned residential layout. The proposals include new building footprints, internal access roads, driveways, parking areas and landscaped areas arranged within the red line boundary.

The proposed drained impermeable area for the development is approximately 1,550m², comprising roof areas, access roads, parking and associated hardstanding. Surface water runoff from these areas will be collected and managed through a formal attenuation system prior to controlled discharge to the existing private drainage network.

The development layout has been designed to work with the existing site levels and drainage constraints, allowing surface water to be conveyed in a controlled manner towards the existing private drainage route serving the wider landholding.

Foul water drainage will be managed separately via a communal package treatment plant serving all nine dwellings. Treated effluent will discharge to the same private drainage network / watercourse, subject to final treatment plant specification and compliance with the General Binding Rules.

The development therefore provides an opportunity to formalise the existing drainage arrangements, improve runoff control and deliver a betterment over the current site condition while maintaining a practical and policy-compliant drainage solution.



5. Surface Water Drainage Strategy

Surface water generated by the development will be managed through a Sustainable Drainage Systems (SuDS) based approach incorporating source control, attenuation and controlled discharge to the existing private drainage network serving the wider Floran Farm landholding.

Runoff arising from roof areas, access roads, parking areas and hardstanding associated with the proposed development will be directed by finished ground levels and private drainage infrastructure towards an on-site attenuation system. The total proposed drained impermeable area is approximately 1,550m².

Surface water will be collected and conveyed to a below-ground cellular attenuation system designed to provide temporary storage during storm events. The attenuation system has been sized for the 1 in 100-year return period plus 40% climate change event, with the critical duration identified as the 120-minute winter storm.

The proposed attenuation storage provides approximately 55m³ of effective storage volume, based on a 58m² plan area, 1.0m effective depth and 95% void ratio. This provides sufficient capacity to manage the design event without on-site flooding.

Flows from the attenuation system will discharge via a flow control chamber incorporating a restricted outlet set to 2.9l/s, equivalent to the calculated QBAR greenfield runoff rate for the site. This ensures that post-development runoff rates are reduced to greenfield conditions and provides a clear betterment over the existing hardstanding drainage regime.

Restricted flows will then discharge to the existing private drainage network, including the large diameter drainage route serving the wider landholding to the north of the site. This established private drainage system provides the downstream discharge route for the development.

The proposed arrangement therefore formalises the existing drainage regime and reduces both peak runoff rates and likely runoff volumes when compared with the current site condition. The strategy ensures that the development does not increase flood risk on-site or elsewhere.

Component	Function	Location
Permeable paving / hardstanding	Provides source control and reduces runoff from access roads and parking areas	Throughout development
Cellular attenuation tank	Provides temporary storage for the 1:100yr +40%CC event	Within site layout
Flow control chamber	Restricts discharge to greenfield runoff rate of 2.9l/s	Downstream of attenuation system
Inspection chamber / silt trap	Provides sediment settlement and maintenance access	Upstream of outfall connection
Existing private drainage network	Receives controlled discharge from site	North of site within wider landholding

5.1 Proposed Surface Water Discharge Options

In accordance with the drainage hierarchy set out within the Planning Practice Guidance (PPG) and CIRIA C753 – The SuDS Manual, the options for surface water disposal have been considered in order of preference.

Infiltration to ground

Infiltration to ground has been considered as part of the drainage appraisal. The site is underlain by Upper Tunbridge Wells Sand Formation bedrock comprising interbedded sandstone and siltstone, with no superficial deposits present. While some localised infiltration may occur, no site-specific BRE365 infiltration testing has been undertaken and infiltration performance cannot be reliably confirmed at planning stage.

Given the absence of verified infiltration data, it is not considered appropriate to rely on infiltration as the primary drainage mechanism for the proposed development. A fully infiltration-led strategy would introduce unnecessary uncertainty and would be less robust from both a planning and delivery perspective.

Infiltration may provide incidental betterment within permeable surfaces and landscaped areas; however, the primary design strategy is based on attenuation and controlled discharge to an existing private drainage network.

Discharge to a surface water body / existing private drainage network

The site is already served by an established private drainage network associated with the wider Floran Farm landholding, including a large diameter drainage route located to the north of the application site. This provides the existing downstream discharge route for the site and wider holding.

This existing private drainage system represents the first viable and deliverable surface water discharge option and forms the proposed outfall for the development.

Surface water runoff from the proposed development will be collected from approximately 1,550m² of drained impermeable area, comprising roofs, access roads, parking areas and associated hardstanding. Runoff will be attenuated on-site within a below-ground cellular storage system prior to controlled discharge.

The attenuation system has been sized for the 1 in 100-year rainfall event including a 40% allowance for climate change. Hydraulic calculations confirm a required effective storage volume of approximately 55m³, based on a 58m² plan area, 1.0m effective depth and 95% void ratio.

Flows will discharge via a flow control chamber incorporating a restricted outlet set to 2.9l/s, equivalent to the calculated QBAR greenfield runoff rate for the site. This ensures that post-development runoff rates are reduced to greenfield conditions and provides a clear betterment over the existing hardstanding drainage regime.

The proposed strategy therefore formalises the existing drainage arrangement while reducing both peak runoff rates and likely runoff volumes when compared with the current site condition.

The downstream drainage route and discharge connection are located within land under the applicant's control.

Discharge to surface water sewer or highway drain

There are no public surface water sewers or highway drainage systems available within the immediate vicinity of the site that could receive surface water runoff. This option is therefore not considered feasible.

Discharge to combined sewer

No combined sewer infrastructure is present within the vicinity of the site and therefore this option is not applicable.

Demonstration of Surface Water Performance

Based on the hydraulic calculations undertaken, the proposed attenuation system provides sufficient storage capacity to accommodate the critical 1 in 100-year rainfall event including a 40% climate change allowance while restricting discharge to 2.9l/s.

The proposed surface water drainage system will therefore provide a policy-compliant and deliverable drainage solution, ensuring that runoff is controlled within the site and discharged at greenfield runoff rates with no increase in flood risk either on-site or to surrounding land.

5.2 Water Quality

Water quality considerations have been assessed in accordance with the Simple Index Approach set out in CIRIA C753 – The SuDS Manual.

The proposed development comprises nine residential dwellings with associated roofs, access roads, parking areas and hardstanding. The principal sources of surface water runoff are therefore roof drainage together with residential access and parking areas.

Under the CIRIA C753 classification system:

- Residential roofs are classified as very low pollution hazard.
- Residential parking and access areas are classified as low pollution hazard.

The proposed drainage system provides an appropriate level of treatment prior to discharge to the existing private drainage network.

Runoff from the developed areas will first be collected via permeable paving and standard drainage infrastructure, providing initial interception and settlement of sediments. Surface water will then pass to the cellular attenuation system, with upstream inspection chambers configured to allow silt settlement and routine maintenance access.

A flow control chamber will provide regulated discharge to the existing private drainage network at a restricted greenfield runoff rate. The attenuation system and associated drainage infrastructure provide further settlement and water quality improvement through sediment capture and controlled conveyance.

Given the low pollution hazard associated with the proposed residential land use and the treatment provided through source control, attenuation and sediment management, the proposed drainage arrangement provides an appropriate level of water quality mitigation in accordance with CIRIA C753 guidance.

The system ensures that surface water runoff is managed, filtered and controlled prior to discharge and that no untreated runoff is discharged from the site.

6. Foul Water Drainage Strategy

The site is not served by a public foul water sewer and no viable connection to the public sewer network is available within the vicinity of the development. Foul water drainage must therefore be managed via a private treatment solution in accordance with Building Regulations Part H and the Environment Agency General Binding Rules.

Foul water from the proposed nine dwellings will discharge to a communal package treatment plant serving the entire development. The proposed system is a Klargestec BioTec+ 9 sewage treatment plant, which has been selected to provide a reliable and compliant treatment solution for the scale of development proposed.

The Klargestec BioTec+ 9 is designed to serve up to 50 population equivalent and provides a daily flow capacity of 7.5m³/day, which exceeds the anticipated foul flow from the development and provides additional operational resilience. The unit is third-party tested to EN 12566-3 and achieves a stated 98.5% BOD₅ effluent quality, making it suitable for discharge to surface water under the relevant General Binding Rules requirements.

For planning-stage assessment, foul water flows have been calculated using a conservative occupancy assumption of 33 persons across the development and a design flow of 150l/person/day, as set out below:

- Plots 1 to 3, 4-bed dwellings: 4 persons each = 12 persons
- Plots 4, 5 and 8, 3-bed dwellings: 4 persons each = 12 persons
- Plots 6, 7 and 9, 2-bed dwellings: 3 persons each = 9 persons

Total occupancy = 33 persons

Daily foul flow = 33 × 150l/person/day = 4,950l/day = 4.95m³/day

This remains below the 5m³/day threshold for discharge to surface water under the General Binding Rules and therefore provides a compliant basis for discharge, subject to final treatment plant specification and confirmation of all relevant discharge requirements.

Treated effluent from the package treatment plant will discharge to the existing private drainage network / watercourse serving the wider Floran Farm landholding. This existing drainage route provides the established downstream discharge point for the site and avoids the need for a separate drainage field or off-site sewer connection.

The foul water drainage strategy therefore provides a practical and deliverable solution which aligns with the site constraints, makes use of existing private infrastructure and ensures compliance with the relevant regulatory requirements.

6.1 General Binding Rules Compliance

The proposed foul water drainage strategy has been reviewed against the Environment Agency General Binding Rules for small sewage discharges to a surface water.

The proposed Klargestar BioTec+ 9 package treatment plant will serve the nine dwellings and discharge treated effluent to the existing private drainage network / watercourse serving the wider Floran Farm landholding. Based on the current development proposals, the system is considered capable of operating in compliance with the relevant General Binding Rules, subject to final installation and ongoing maintenance.

Requirement	Proposed Arrangement
Discharge must be from a package treatment plant, not a septic tank, for discharge to surface water	Klargester BioTec+ 9 package treatment plant specified
Daily discharge to surface water must not exceed 5m³/day	Calculated foul flow = 4.95m ³ /day based on 33 persons at 150l/person/day
Discharge must not cause pollution of surface water	Treated effluent from third-party tested plant with stated 98.5% BOD5 effluent quality
System must be correctly installed and maintained	Private communal management arrangement to be secured through conveyancing and maintenance obligations
Plant must comply with recognised treatment standards	Klargester BioTec+ 9 third-party tested to EN 12566-3
No public foul sewer reasonably available	No public foul sewer present within vicinity of the site

The final treatment plant installation, outfall arrangement and maintenance regime will be confirmed at detailed design stage. Should the final calculated discharge exceed 5m³/day, or if any site-specific constraints arise, an Environmental Permit may be required.

7. Management and Maintenance Schedule

All drainage infrastructure associated with the proposed development will remain private and will be maintained through a communal management arrangement secured through the property contracts and conveyancing documentation for each dwelling.

This will include the surface water attenuation system, flow control chamber, inspection chambers, private drainage network, package treatment plant and treated effluent discharge route. Each property owner will contribute to the ongoing inspection, servicing and maintenance of the communal drainage system to ensure long-term operation and compliance.

Regular inspection and maintenance are required to ensure the continued performance of both the surface water and foul water drainage systems and to prevent blockages, sediment build-up or mechanical failure.

Surface water drainage components, including gullies, catchpits, inspection chambers and the attenuation system, will be inspected periodically and cleared of debris, silt and sediment as required. The flow control device will be inspected to ensure unrestricted operation and to maintain the designed discharge rate of 2.9l/s.

The private drainage network and downstream discharge route will also be subject to periodic inspection to confirm free flow conditions and to ensure that no blockage, damage or deterioration occurs within the existing drainage route serving the wider landholding.

The Klargestar BioTec+ 9 package treatment plant will be maintained in accordance with the manufacturer's recommendations, including regular servicing, alarm checks, desludging and operational inspections by a suitably qualified contractor. This will ensure continued compliance with the General Binding Rules and protect the quality of the receiving water environment.

An outline maintenance schedule is provided below.

Drainage Element	Maintenance Requirement	Frequency	Responsibility
Gullies and catchpits	Inspect and remove silt, debris and blockages	Every 6 months and after major storm events	Management arrangement / residents
Inspection chambers	Inspect and clear as required	Every 6 months	Management arrangement / residents
Cellular attenuation system	Inspect inlet, outlet and sediment build-up	Annually	Management arrangement / residents
Flow control chamber	Inspect operation and clear obstructions	Every 6 months	Management arrangement / residents
Private drainage network	Inspect downstream discharge route and pipe condition	Annually	Management arrangement / residents

Drainage Element	Maintenance Requirement	Frequency	Responsibility
Package treatment plant	Full service, inspection and alarm checks	As per manufacturer guidance, typically every 6–12 months	Specialist contractor
Package treatment plant	Desludging	As required, typically annually	Specialist contractor

The proposed maintenance regime ensures that the drainage system remains effective for the lifetime of the development and that responsibility for ongoing management is clearly established.

8. Conclusions

This report has assessed the surface water and foul water drainage requirements for the proposed residential development at Land south of Floran Farm, Hophurst Hill, Crawley Down, comprising nine dwellings with associated access roads, parking and landscaping.

The site is not served by public foul water or surface water sewers and therefore requires private drainage solutions for both surface water and foul water management. The site is, however, served by an existing private drainage network associated with the wider Floran Farm landholding, including an established large diameter drainage route which provides the downstream discharge route.

Surface water runoff from approximately 1,550m² of drained impermeable area will be attenuated on-site within a cellular storage system and discharged at a restricted rate of 2.9l/s, equivalent to the calculated QBAR greenfield runoff rate for the site. This provides a clear betterment over the existing hardstanding drainage regime by reducing peak runoff rates and likely reducing runoff volumes.

Foul water will be managed via a communal Klargestar BioTec+ 9 package treatment plant serving the nine dwellings. Treated effluent will discharge to the existing private drainage network / watercourse. Based on an assumed occupancy of 33 persons, the calculated foul flow is 4.95m³/day, which remains below the 5m³/day threshold for discharge to surface water under the General Binding Rules.

The proposed strategy follows the Sustainable Drainage Systems (SuDS) hierarchy, makes use of existing private drainage infrastructure and provides a practical and deliverable solution for the site. The development will not increase flood risk on-site or elsewhere and will provide an improvement over the existing drainage condition.

The proposed surface water and foul water drainage strategy is therefore considered suitable to support the planning application and compliant with national policy and current drainage guidance.

Note:

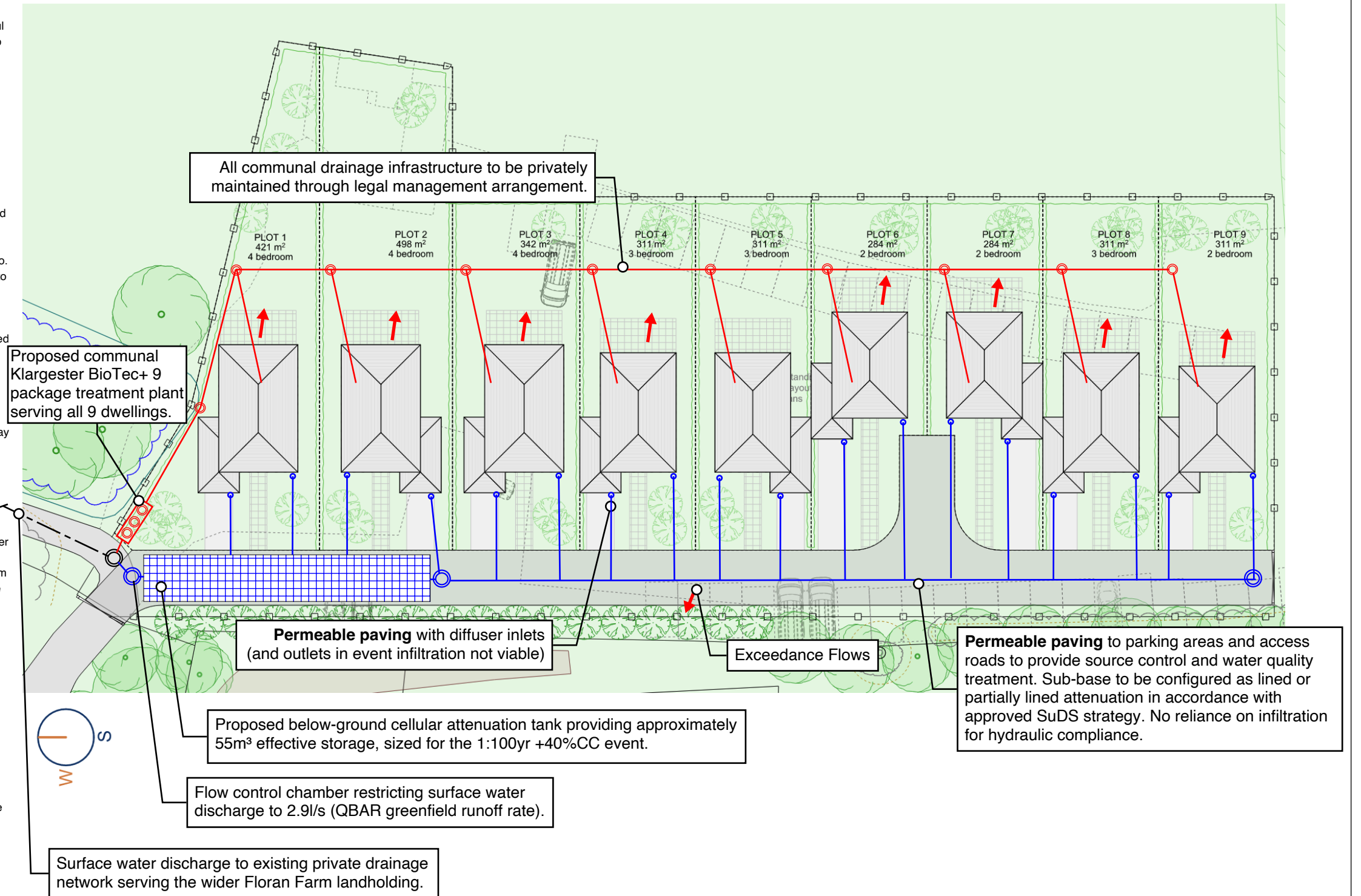
This report has been prepared for the purposes of submitting to the local planning authority for review in relation to the associated drainage strategy for the proposed development, and uses the most up-to-date information available to us at the time. It should not be relied upon by anyone else or used 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.

	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	27 April 2026	27 April 2026	27 April 2026

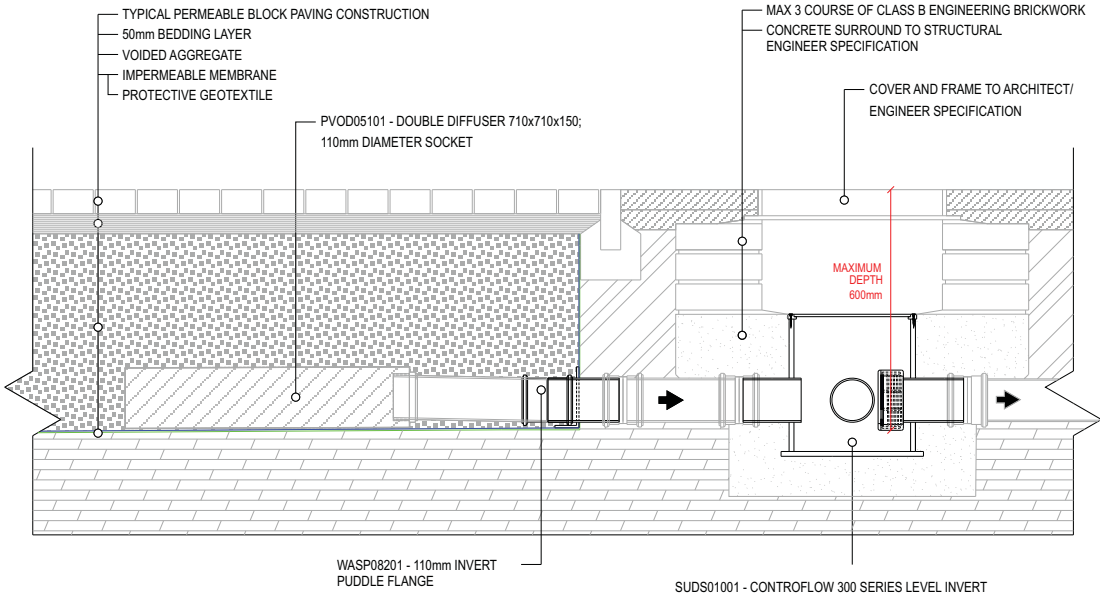
Appendix A – Proposed Foul and Surface Water Drainage Layout

Drainage Notes

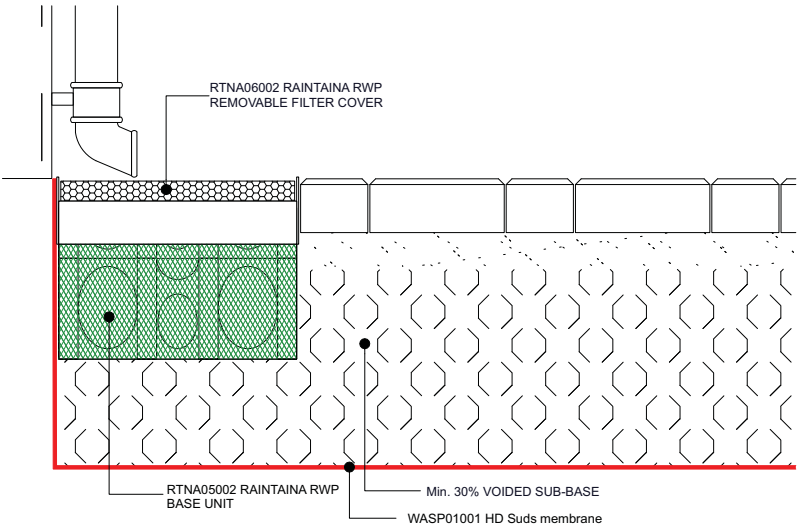
1. This drawing is to be read in conjunction with the Surface Water and Foul Water Drainage Strategy prepared by Flume Consulting Engineers Ltd, Job No. 1735, and all relevant architectural and site layout drawings.
2. This drainage layout is prepared for planning purposes only and demonstrates the proposed drainage strategy in principle. Detailed design, final pipe sizing, invert levels, cover levels, structural design and construction issue information shall be completed at detailed design stage by others.
3. Surface water runoff from roofs, access roads, parking areas and associated hardstanding shall be collected and conveyed to the proposed below-ground cellular attenuation system.
4. The total proposed drained impermeable area is approximately 1,550m².
5. The attenuation system has been sized for the 1 in 100-year return period rainfall event plus 40% climate change allowance.
6. The attenuation storage provides approximately 55m³ effective storage volume based on a 58m² plan area, 1.0m effective depth and 95% void ratio.
7. Surface water discharge from the attenuation system shall be restricted to 2.9l/s via a suitable flow control device, equivalent to the calculated QBAR greenfield runoff rate for the site.
8. Restricted discharge shall connect to the existing private drainage network serving the wider Floran Farm landholding, including the established large diameter drainage route to the north of the site.
9. Existing downstream drainage routes and discharge points shall be retained and protected during construction.
10. No surface water runoff shall discharge unrestricted from the site onto the public highway or adjacent land.
11. Finished ground levels shall be set to ensure positive drainage falls away from buildings and towards the proposed drainage system.
12. Exceedance flows during rainfall events exceeding the design capacity shall be directed away from buildings and safely routed within roads, hardstanding and landscaped areas without increasing flood risk to third parties.
13. Permeable paving areas shall be constructed in accordance with the manufacturer's recommendations and shall provide source control and water quality treatment prior to discharge.
14. Silt traps, catchpits and inspection chambers shall be provided upstream of the attenuation system and flow control device to allow sediment capture and maintenance access.
15. All drainage infrastructure shall be accessible for inspection, maintenance and replacement for the lifetime of the development.
16. Foul water drainage from all nine dwellings shall discharge to the proposed communal package treatment plant.
17. The proposed foul water treatment system shall comprise a Klargester BioTec+ 9 package treatment plant, or approved equivalent, sized to serve the full development.
18. The foul water design flow is based on an assumed occupancy of 33 persons at 150l/person/day, giving a total discharge of 4.95m³/day.
19. Treated effluent discharge shall remain below 5m³/day to comply with the Environment Agency General Binding Rules for discharge to surface water, unless otherwise agreed or permitted.
20. Treated effluent from the package treatment plant shall discharge to the existing private drainage network / downstream watercourse serving the wider landholding.
21. Final treatment plant installation, outfall arrangement and discharge location shall comply with Building Regulations Part H, manufacturer requirements and the Environment Agency General Binding Rules.
22. The package treatment plant shall be maintained in accordance with the manufacturer's recommendations, including regular servicing, desludging and inspection by a suitably qualified contractor.
23. All communal drainage infrastructure including attenuation, flow control devices, private drainage network and package treatment plant shall be maintained under a private communal management arrangement secured through legal agreements and conveyancing.
24. Contractor to verify all existing drainage routes, invert levels, outfall positions and site levels prior to commencement of works.
25. Any discrepancies between site conditions and the proposed drainage strategy shall be reported to the Engineer prior to construction.



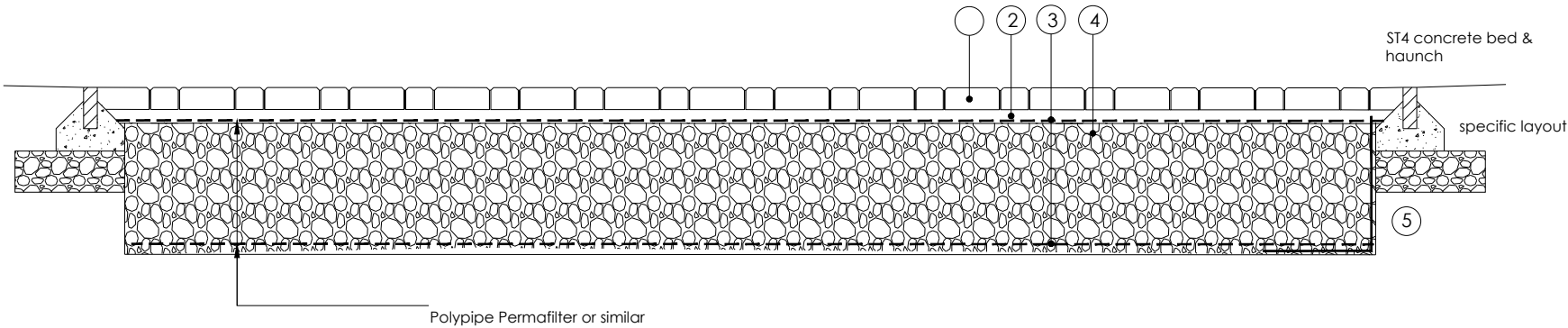
SUDS01001 - CONTROFLOW 300 SERIES LEVEL INVERT MAXIMUM DEPTH APPLICATION



TYPICAL DIFFUSER - FLOW CONTROL DETAIL



TYPICAL RWP DIFFUSER DETAIL



- ① Marshalls Conservation Piora or similar approved
- ② 50mm depth of coarse 6mm aggregate (see Table 2)
- ③ Filtration/separation geotextile Marshalls MT120
- ④ 400mm Open Graded Crushed Rock (OGCR) no fines sub-base (see table 1 for gradings).
- Marshalls Tanking membrane M380 or similar

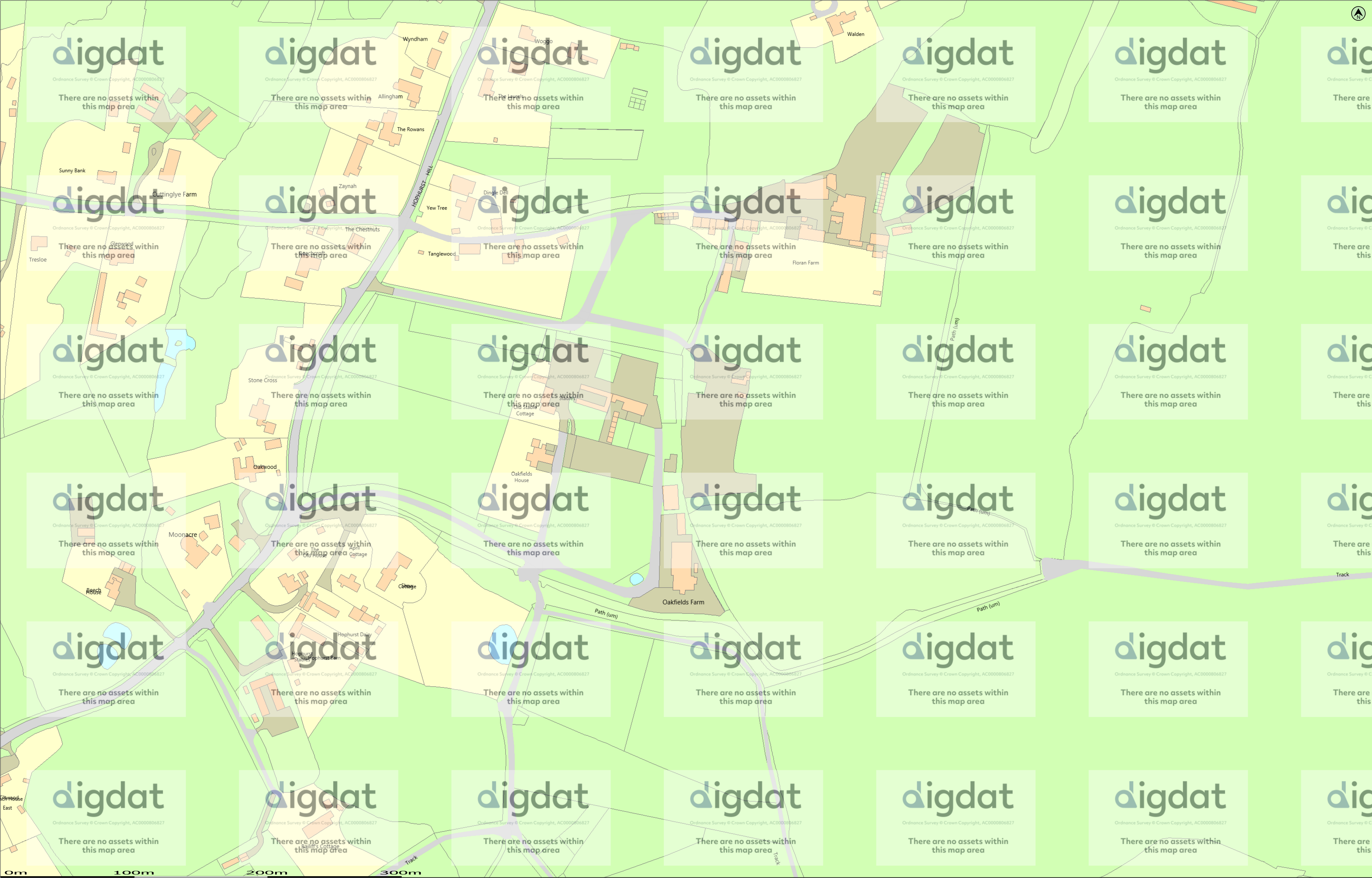
TYPICAL PERMEABLE PAVING DETAIL

Attenuation Tank Detail ('Open' Top)
Sealed Geo-Cellular System
Refer to Plan for Required Layout

Attenuation Tank + Permeable Paving Interaction Construction Detail

Typical Permeable (Lined) Construction Modular Construction Parking Area

Perforated Pipe Protection Detail
Concrete Slab Over (Depth to soffit <0.9m)

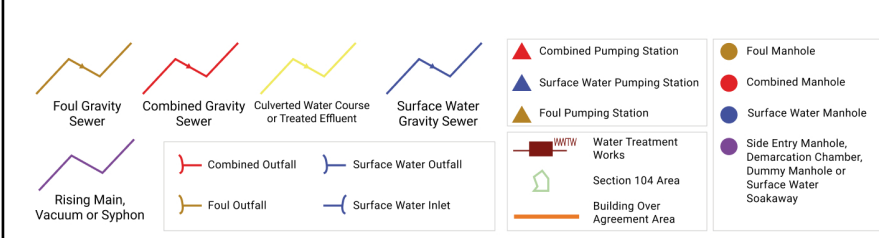


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The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



accounts@fumeconsultants.com
Floran Farm



Wastewater Plan A1
Powered by digdat

Water Management Solutions

Klargester BioTec+ Sewage Treatment Plant

Total P
Removal 60.8%
3.5mg/l phosphate
TNb 75.5%
15mg/l nitrate

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.



*Terms and conditions apply. View online at <https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms>

Klargester BioTec+ Sewage Treatment Plant

Applications

The Klargester BioTec+ range is suitable for use across the following applications:



Single &
Multiple Homes



Light Industrial
Premises



Small
Offices



Farms



Barn
Conversions

Product features

98.5%

Improved effluent
quality – BOD₅ 98.5%



Third party
tested



Easy to install
and operate



Easy Install



Cost Efficient



Low profile cover



Lightweight
no crane needed



Low running costs

Technical Specification

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	m ³ /d	0.9	1.35	1.8	2.4	3	3.75	5.25	7.5
Daily Load	kg BOD ₅ /d	0.36	0.54	0.72	0.96	1.2	1.5	2.1	3
Daily Flow Q ₁₀	m ³ /h	0.09	0.135	0.18	0.24	0.3	0.375	0.525	0.75

For more information on any of our products: T: +44 (0)1296 633 033

E: klargester@kingspan.com or visit klargester.co.uk

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Certificate

Nr. 458.01C01

BioTec +

Sequential Batch Reactor System

Kingspan Water & Energy Ltd.

College Road North, HP22 5EW Aylesbury, United Kingdom

EN 12566-3:2005+A2:2013, Annex B: Treatment efficiency test

Small wastewater treatment systems for up to 50 PT – Part 3:

Packaged and/or site assembled domestic wastewater treatment plants

Detailed results and information on the test are provided in test report PIA2024-458B26.



Extract of performance details (EN 12566-3, Annex B: Treatment efficiency test)

Organic daily load (influent, nominal) 0.30 kg BOD₅/d

Hydraulic daily load (nominal) 0.9 m³/d

Treatment efficiency (nominal)	Efficiency	Effluent
COD	95.9 %	32 mg/l
BOD ₅	98.5 %	5 mg/l
TN _b	75.5 %	15 mg/l
NH ₄ -N	83.6 %	8.3 mg/l
P _{tot}	60.8 %	3.5 mg/l
SS	97.6 %	9 mg/l

Electrical consumption (nominal) 0.61 kWh/d

Number of desludging (complete test – 40.5 weeks) 1

Number of maintenance operations during the test (without start-up phase) 1

Tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH

Hergenrather Weg 30

52074 Aachen, Germany

This certificate is for information purposes only and replaces neither the related test report nor the declaration of performance or the CE marking. The results relate only to the tested object.

PIA – Sustainable Certification

[Signature]
geprüft – tested – testé

June 2024, Dipl.-Ing. Gabriel Schatzki
Head of department "Wastewater Treatment"



Notified Body
No.: 1739



Certified according to
ISO 9001:2015

Appendix B - Surface Water Hydraulic Calculations

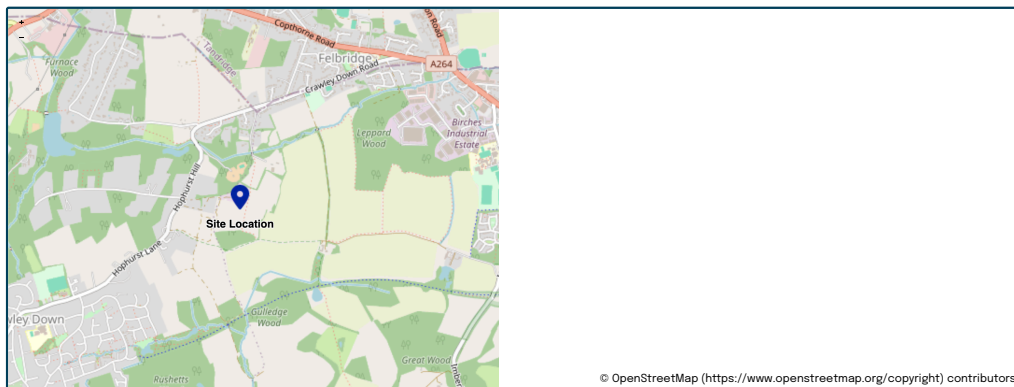
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	16/04/2026
Calculated by	TQ
Reference	Floran Farm
Model version	2.2.3

Location

Site name	Land South of Floran Farm
Site location	Crawley



Site easting (British National Grid)	535988
Site northing (British National Grid)	138599

Site details

Total site area (ha)	0.4998	ha
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Greenfield runoff

Method

Method	IH124
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IH124

	My value	Map value
SAAR (mm)	820	820
How should SPR be derived?	WRAP soil type	
WRAP soil type	4	4
SPR	0.47	
QBar (lt124) (l/s)	2.9	l/s

Growth curve factors

	My value	Map value
Hydrological region	7	7
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)	2.5	l/s
Flow rate 2 year (l/s)	2.6	l/s
Flow rate 10 years (l/s)	4.7	l/s
Flow rate 30 years (l/s)	6.7	l/s
Flow rate 100 years (l/s)	9.3	l/s
Flow rate 200 years (l/s)	10.9	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 [uksds.com](https://www.ukstds.com/) (<https://www.ukstds.com/>). The use of this tool is subject to the UK SUDs terms and conditions and licence agreement, which can both be found at [uksds.com/terms-conditions](https://www.ukstds.com/terms-conditions) (<https://www.ukstds.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.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	175.0
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)
Attenuation	0.110	5.00	2.000	450	2.000	0.000
Outfall	0.000		2.000	450	2.000	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	Attenuation	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	21.7	1.900	1.900	0.110	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	2.000	0.000	1.900	2.000	0.000	1.900

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

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Attenuation	2.000	2.000	450				
				0	1.000	0.000	100
Outfall	2.000	2.000	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 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

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

Node Attenuation Online Depth/Flow Control

Flap Valve	x	Invert Level (m)	0.000	Design Flow (l/s)	2.9
Replaces Downstream Link	✓	Design Depth (m)	1.000		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	2.900	1.000	2.900

Node Attenuation Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	0.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	162

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	58.0	58.0	1.000	58.0	58.0	1.001	0.0	58.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 15 minute summer	488.233	138.153	100 year +40% CC 360 minute summer	56.677	14.585
100 year +40% CC 15 minute winter	342.620	138.153	100 year +40% CC 360 minute winter	36.841	14.585
100 year +40% CC 30 minute summer	320.551	90.705	100 year +40% CC 480 minute summer	43.979	11.622
100 year +40% CC 30 minute winter	224.948	90.705	100 year +40% CC 480 minute winter	29.219	11.622
100 year +40% CC 60 minute summer	214.603	56.713	100 year +40% CC 600 minute summer	35.604	9.738
100 year +40% CC 60 minute winter	142.577	56.713	100 year +40% CC 600 minute winter	24.327	9.738
100 year +40% CC 120 minute summer	129.587	34.246	100 year +40% CC 720 minute summer	31.433	8.424
100 year +40% CC 120 minute winter	86.094	34.246	100 year +40% CC 720 minute winter	21.125	8.424
100 year +40% CC 180 minute summer	97.729	25.149	100 year +40% CC 960 minute summer	25.432	6.697
100 year +40% CC 180 minute winter	63.526	25.149	100 year +40% CC 960 minute winter	16.847	6.697
100 year +40% CC 240 minute summer	75.977	20.078	100 year +40% CC 1440 minute summer	18.055	4.839
100 year +40% CC 240 minute winter	50.477	20.078	100 year +40% CC 1440 minute winter	12.134	4.839

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
120 minute winter	Attenuation	118	0.998	0.998	26.1	55.1713	0.0000	SURCHARGED
15 minute summer	Outfall	1	0.000	0.000	2.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link Depth/Flow	DS Node	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	Attenuation	Depth/Flow	Outfall	2.9	75.5