

Surface Water Drainage Strategy: Beckley Stud

Date	Prepared For	Reference
March 2026	Equine America UK Ltd	73541



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Contract

GeoSon Limited were instructed by Mr Lee Middleton of Equine America UK Ltd, by an email dated 8th December 2025, to undertake a Surface Water Drainage Strategy to support a retrospective application for development at Beckley Stud, Reeds Lane, Southwater.

Project	Surface Water Drainage Strategy for Planning
Prepared For	Equine America UK Ltd
Location	Beckley Stud, Reeds Lane, Southwater, West Sussex RH13 9DQ
Application	DC/22/0388: Retention of an existing green steel-clad building and mono-pitch lean-to for storage and distribution use by Equine America UK
Our Reference	73541
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Purpose

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Introduction

Context

GeoSon Limited have been instructed by Equine America UK Ltd to undertake a Surface Water Drainage Strategy to support a retrospective planning application for development at Beckley Stud, Reeds Lane, Southwater, West Sussex RH13 9DQ.

This assessment has been undertaken in accordance with the revised National Planning Policy Framework (NPPF) December 2024, the associated Planning Practice Guidance (PPG), the CIRIA SuDS Manual c753 and the Sewers for Adoption guidance.

Study Objectives

The proposals comprise retention of an existing green steel-clad building and mono-pitch lean-to for storage and distribution use by Equine America UK.

Given that the development altered the impermeable coverage at the site, Horsham District Council have applied Condition 3 to the retrospective application; reference DC/22/0388.

Condition 3 requires a Surface Water Drainage Strategy to be completed and submitted, outlining the drainage arrangements for the building in question.

Condition 3 is worded as follows:

Within three months of the date of this decision, details of the means of surface water disposal drainage system shall be submitted to and approved in writing by the Local Planning Authority. The development shall be implemented in accordance with the approved scheme in a timetable to be agreed with the LPA.

In accordance with the NPPF, CIRIA SuDS manual and West Sussex County Council's drainage guidance all surface water drainage strategies should follow the Drainage Hierarchy whereby discharge options are considered in the following order:

1. Stormwater reuse,
2. Discharge to ground,
3. Discharge to watercourse,
4. Discharge to surface water sewer,
5. Discharge to combined sewer.

This report details the preferred method for managing post development surface water runoff generated by newly introduced impermeable surfacing at the site. This includes how runoff can be managed now and for the lifetime of the development, so that future site users and third-party land will not be at an increased risk of flooding as a result of the proposals.

Site Details

Site Description

The retrospective application relates to retention of a steel-clad building and mono-pitch lean-to at Beckley Stud, Reeds Lane, Southwater, West Sussex RH13 9DQ.

The steel-clad barn style building is used by Equine America UK for the storage and distribution of stock. The building incorporates a 'lean-to' element on its southern elevation.

Both buildings form part of the wider equestrian operations at the site which encompass the breeding and training of horses.

According to plans provided by the applicant, the wider site measures approximately 11 acres and comprises paddocks, a sand school, lunge arena and a brick built stable building.

The site is accessed from the east via Reeds Lane.

Having reviewed aerial imagery, the surrounding area is primarily characterised by a mix of agricultural land, residential use and woodland.

Site Address	Beckley Stud, Reeds Lane, Southwater, West Sussex, RH13 9DQ
Site Area	4.45ha
OS NGR	TQ 16778 27863
County	West Sussex
Local Planning Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council

Table 1: Site Details

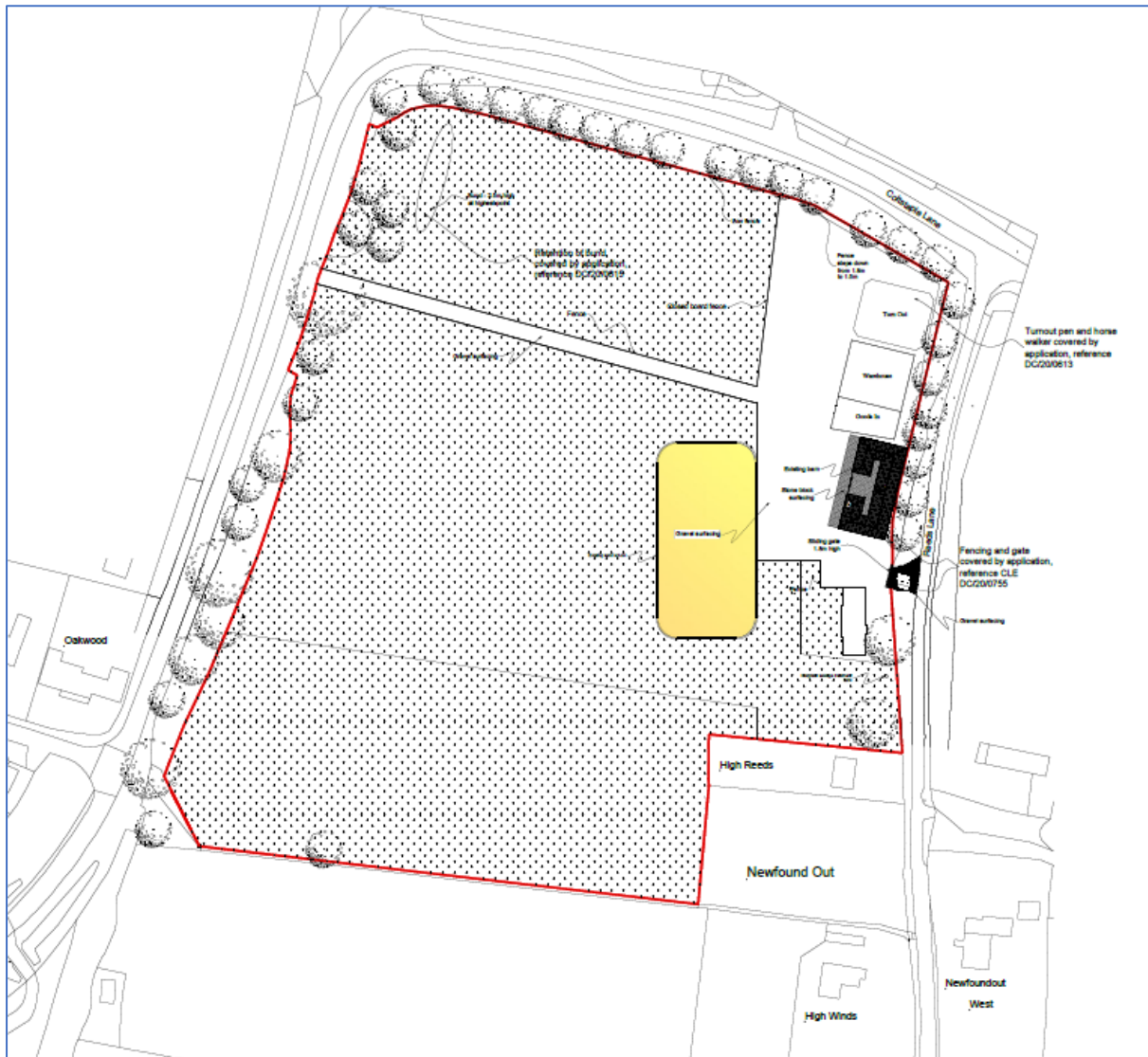


Figure 1: Site Location (Source: Agrarian)

Topography

A topographic survey was undertaken at the site by Foresite Geomatics in October 2025 and provided by the applicant for inclusion within this report. A copy of the topographic survey can be seen in Appendix A.

The topographical survey covers land in the east of the site and suggests that this area slopes in a westerly direction.

External ground levels adjacent to the steel-clad building and mono-pitch lean-to structure are reported to range between 75.25mAOD and 75.57mAOD.

The access road which connects the buildings to Reeds Lane is reported to have an elevation range of 74.82mAOD to 75.57mAOD.

The topographic survey also includes measured spot heights within the sand school, located within the centre of the site. According to the topographic survey land within the sand school has an elevation of 74.63mAOD to 74.80mAOD.

Environment Agency 1.0m LiDAR data has been used to review the general topographic profile of the wider area. EA LiDAR data indicates that the immediate surrounding land slopes in a southerly and westerly direction away from the site (refer to Figure 2).

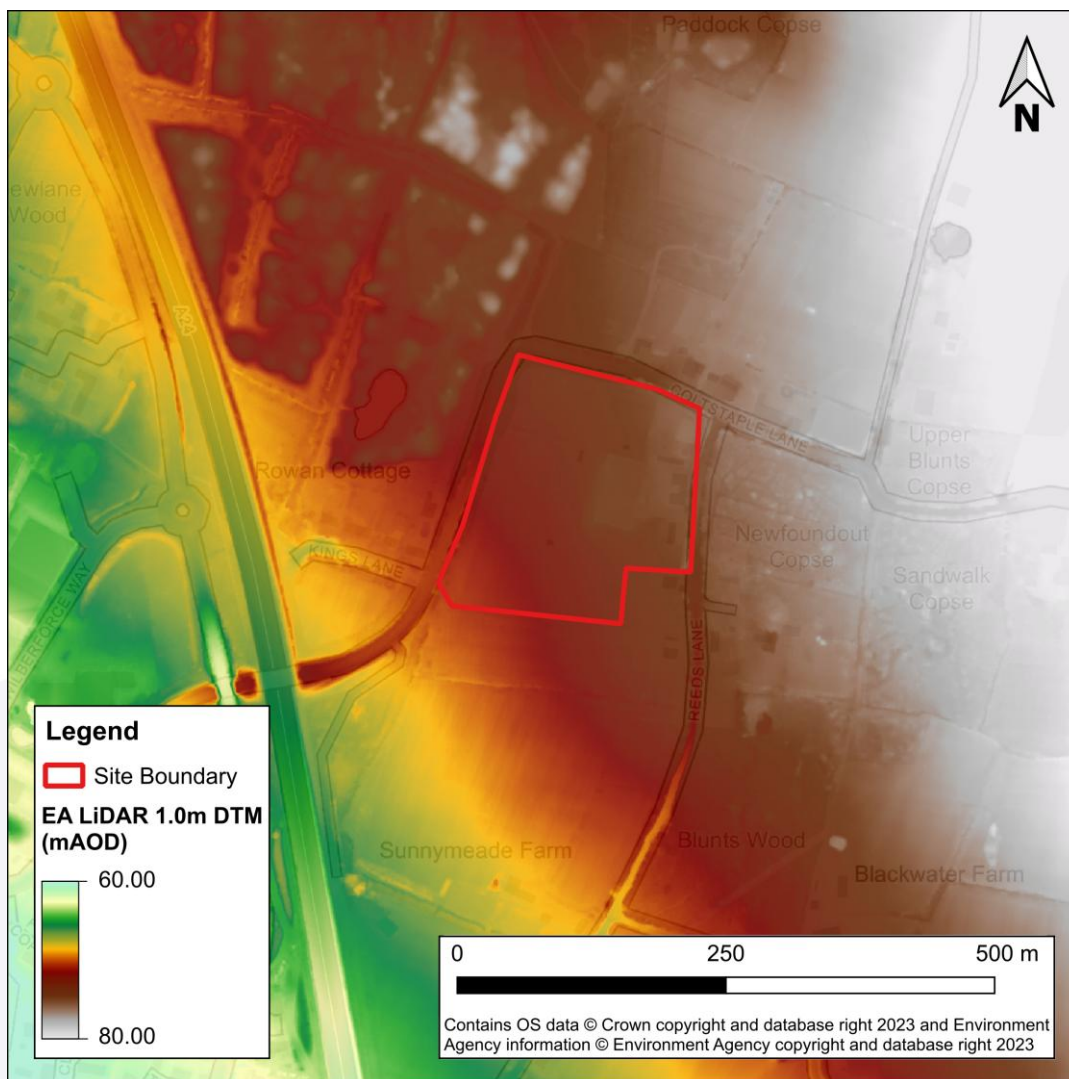


Figure 2: Topography of the Site and Surrounding Area

Geology and Hydrogeology

Review of online British Geological Survey (BGS) records indicate that the site is located directly upon Horsham Stone Member (Sandstone) bedrock. This geological strata was formed during the Hauterivian Age some 132.6 ± 0.6 Ma and 125.77 million years ago.

Records state that Horsham Stone Member is typically characterised by: *Sandstone, calcareous, generally fine-grained, micaceous, locally well laminated, pale grey to greenish/olive grey. Contains clayey partings and lignite fragments and rootlet traces. Frequently shows internal slumping and deformation. Informally subdivided by an interposed mudstone, south of Christ's Hospital [TQ 148 285] in the Horsham area.*

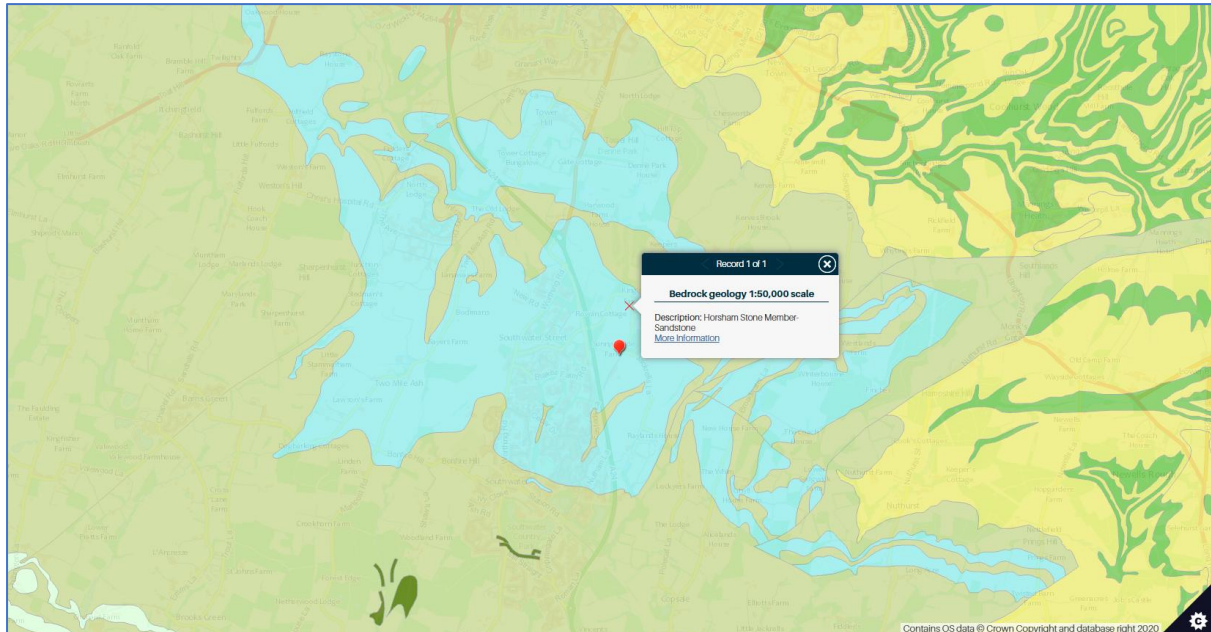


Figure 3: Bedrock Geology Map (Source: British Geological Survey)

According to BGS data the site is not underlain by superficial deposits.

Review of Landis Soilscales online viewer suggests that the site is located in an area where the soils are classified as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'

DEFRA 'Magic Maps' show that the site is not located within a groundwater Source Protection Zone. However, the application area is situated upon a 'Secondary A' bedrock aquifer.

Nearby Watercourses

Review of OS Mapping and aerial imagery indicates that there are no open drainage features at, or along the boundary of, the site. However, several watercourses have been identified within a 1.0km radius of the development.

The features closest to the site are all classified as Ordinary Watercourses. Ordinary Watercourses within this area are managed by West Sussex County Council (Lead Local Flood Authority).

The watercourses within a 1.0km radius of the site are shown in Figure 4 (below).

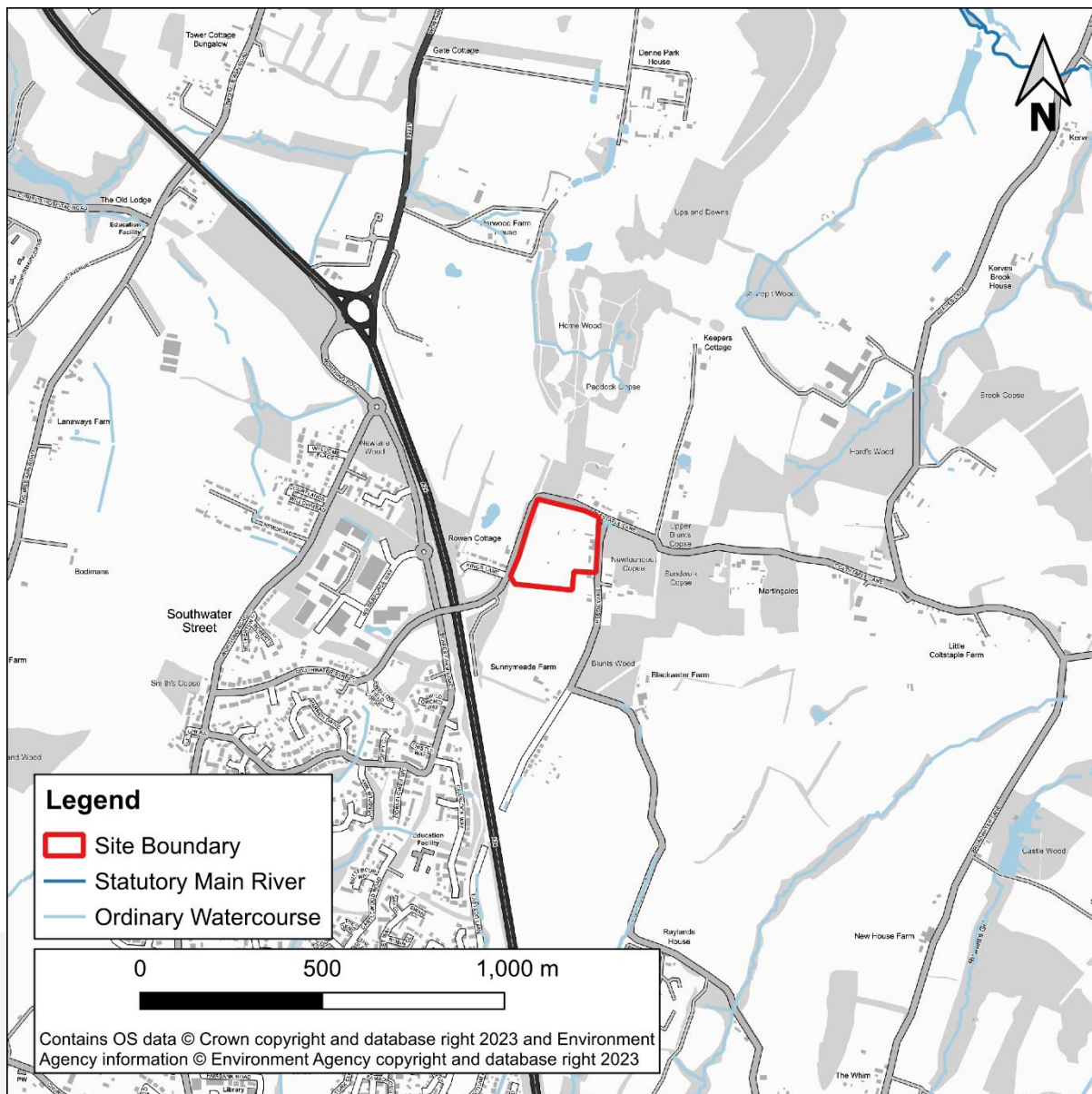


Figure 4: Watercourses Near the Site

Given the rural nature of the site and review of EA LiDAR data, it is considered likely that additional drainage features are located within vicinity of the application area which have not been captured on the OS mapping or aerial imagery.

The applicant confirmed in an email dated 21st January 2026 that a drainage ditch is located in the west of the site and runs along the boundary line of two horse paddocks to the west of the sand school.

The applicant has provided a plan and video which shows the location of the drainage ditch in relation to the steel-clad building and mono-pitch lean-to. A copy of the plan and stills from the video are shown in Figure 5 and Figure 6, below.



Figure 5: Location of Existing Drainage Ditch (Source: Equine America UK)



Figure 6: Photos of the Drainage Ditch on Site (Source: Equine America UK)

The applicant has confirmed that the section of drainage ditch which runs through the west of the site (shown in Figure 6) has the following dimensions:

- Width: 1.20m
- Depth: 0.8m

The ditch is cleared annually and accepts runoff from the surrounding land.

The topographic survey does not extend to cover this area. As such, EA LiDAR data has been used to estimate the cover and invert level of the eastmost (upstream) section of the ditch.

Based on Environment Agency LiDAR data, the section of drainage ditch located to the west of the footpath between the sand school and the paddocks is conservatively estimated to have a cover and invert level of 73.40mAOD and 72.60mAOD, respectively.

Nearby Public Sewerage Infrastructure

An Asset Location Search has been obtained from Southern Water and shows that there are no main surface water sewers located within the immediate surrounding area.

The closest sewer system to the site is a foul drainage run located some 250m west of the steel-clad building within the rear garden of properties along Kings Lane (refer to Figure 7 and Appendix B).



Figure 7: Asset Location Search Map (Source: Southern Water)

At the time of writing this strategy, the discharge arrangements for the existing buildings at the site are not known.

Any construction activities within 3.0m of a main sewer will require permission from Southern Water, by way of a Buildover Agreement, prior to being undertaken.

Additionally, if required, post development discharge to a main sewer system will be subject to receipt of a Section 106 agreement from Southern Water.

Existing Flood Risk

Fluvial / Tidal

According to the Environment Agency's Flood Map for Planning the site is located within Flood Zone 1, defined as land which has less than a 1 in 1000 annual probability of fluvial or tidal flooding.

Having reviewed the fluvial flood risk in the wider area, the closest Flood Zone 2 and 3 extents are located approximately 1.40km north west of the site (associated with land near Christ's Hospital). In light of this, the risk posed to the site from fluvial flooding is considered to be very low.

Furthermore, based on the location of the surrounding watercourses in relation to the site, and the associated elevation difference, any increase in water levels due to climate change are considered unlikely to affect the development.

Surface Water

The Risk of Flooding from Surface Water maps were updated on the 28th January 2025 by the Environment Agency and were subsequently integrated into the Flood Map for Planning on 25th March 2025.

The updated Risk of Flooding from Surface Water data shows the development to be located within an area modelled at "Very Low" risk of flooding.

Other Sources

No information has been provided to suggest that the site has historically been impacted by groundwater flooding or sewer surcharge.

The development is not located within the 'maximum extent of flooding from reservoirs'.

No artificial infrastructure has been identified within the surrounding area which could pose a risk of flooding to the development

Surface Water Drainage Strategy

Planning and Relevant Guidance

Given that the development has altered the impermeable surfacing at the site, Horsham District Council have requested details of post development surface water drainage arrangements.

The aim of this Surface Water Drainage Strategy is to assess how surface water runoff generated by the steel-clad building and mono-pitch lean-to can be managed now and for the lifetime of the development so that future site users and third party land will not be at an increased risk of flooding as a result of the development.

This Surface Water Drainage Strategy has been designed in accordance with national and local guidance including:

- National Planning Policy Framework (NPPF)
- West Sussex County Council's Guide for Master Planning Sustainable Drainage into Developments
- Planning Practice Guidance on Flood Risk and Coastal Change (Updated August 2022)
- National Standards for Sustainable Drainage Systems (SuDS) (June 2025)
- Sustainable Drainage Systems: Non-Statutory Technical Standards
- CIRIA SuDS Manual (c753)
- Sewerage Sector Guidance – Design and Construction Standards
- ICE SuDS Route Maps

Peak Rainfall Intensity Allowance

In May 2022 the Environment Agency issued revised peak rainfall intensity allowances for Management Catchments in England. The update introduced a regional variation in rainfall uplifts to account for Climate Change based on Management Catchment and development lifetime.

The Environment Agency published the Peak Rainfall Allowance Map which shows anticipated changes in peak rainfall intensity over time based on drainage catchment.

According to the EA's Peak Rainfall Allowance Map the site is located within the Adur and Ouse Management Catchment. Peak rainfall allowances for this catchment are as follows:

3.3% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	20%	35%
2070s	20%	40%
1% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	20%	45%
2070s	25%	45%

Table 2: Adur and Ouse Management Catchment Peak Rainfall Allowances

The specific Climate Change allowance required to be applied within the attenuation storage calculations to account for future change in peak rainfall intensity is dependent on the design lifetime of the proposed development.

In accordance with the development lifetime guidance, given the nature of the proposals, the Upper End Allowance for the 2070s epoch should be used for both the 1% and 3.3% annual exceedance probability events.

As such, the SuDS system outlined in this drainage strategy has been designed to accommodate all surface water runoff during the 1% annual exceedance probability Upper End Allowance (45%) Climate Change event.

Urban Creep

Urban creep is the conversion of permeable surfaces to impermeable over time. Typical examples include paving of front gardens to provide parking or extensions to existing buildings.

An allowance for urban creep is required to be considered within the drainage design for residential developments only to account for the incremental change of use from permeable to impermeable surfacing over the lifetime of a development.

Where applicable, the following allowances must be applied to the impermeable area within the site curtilage to account for urban creep:

Residential Development Density (Dwellings per Hectare)	Urban Creep Allowance (%)
≤ 25	10
30	8
35	6
45	4
≥ 50	2
Flats and Apartments	0

Table 3: Urban Creep Allowances

Note: Where the inclusion of the urban creep allowance would increase the total impermeable area to greater than 100% of the site area, the drainage system should be sized to accommodate runoff generated by 100% of the site area.

Given the nature of the proposed development, an allowance for urban creep is not required within the design calculations.

Drainage Hierarchy

In accordance with NPPF guidance and the CIRIA SuDS manual all surface water drainage strategies should follow the Drainage Hierarchy whereby discharge options are considered in the following order:

1. Stormwater reuse,
2. Discharge to ground,
3. Discharge to watercourse,
4. Discharge to surface water sewer,
5. Discharge to combined sewer.

The following sections detail how the drainage hierarchy has been followed and each of the discharge locations considered as part of this drainage strategy.

Water Re-Use

The initial surface water drainage scheme proposed by Batchellor Monkhouse recommended the use of formal rainwater harvesting. However, having discussed this further with the landowner there is not a consistent demand for non-potable water supply at the site. As such, given that lack of daily water demand, rainwater harvesting for use within the building has not been taken forward within this strategy.

Despite the lack of daily water demand, considering that areas of soft landscaping will be retained and that the wider site is in equestrian use, there may be some benefit in having a source of non-potable water supply for irregular use.

Rainwater butts offer a simple mechanism for water re-use. They typically take the form of an above ground storage tank which collects roof runoff from building downpipes. Any stored water within the rainwater butt can subsequently be drawn off at a later time for non-potable uses such as wash-down purposes or irrigation use. In accordance with CIRIA SuDS Manual water re-use SuDS provide an '*indirect amenity value by supporting the resilience of developments and their landscape to changes in climate and water resource availability*'.

Rainwater butts are simple to incorporate within developments and can easily be added onto building downpipes at any stage of a development, with the tank overflow connected to the site's wider drainage system.

In practise, rainwater butts provide little in the way of attenuation storage therefore are not accounted for within the formal attenuation storage calculations. However, they do increase the lag time for storm water to enter a drainage system.

In light of the above, it is considered that there would be a benefit from incorporating rainwater butts into the scheme as a form of water re-use SuDS to reduce post development water demand. An example rainwater butt product sheet is shown in Appendix G.

Infiltration to Ground

Review of online British Geological Survey (BGS) records indicate that the site is located directly upon Horsham Stone Member (Sandstone) bedrock.

As such, the applicant has instructed in-situ ground investigations to ascertain the underlying soil conditions at the site.

Infiltration testing was undertaken by Southern Testing on the 20th January 2026.

A total of three trial pits were excavated to a depth of 2.70-3.00m below the existing ground level, to conduct infiltration testing in accordance with BRE Digest 365 methodology.

Review of Southern Testing's Preliminary Soakaway Report (refer to Appendix C) indicates that all three trial pits failed to drain in accordance with BRE Digest 365 methodology.

As such, based on the ground investigation findings, it is considered that infiltration to ground is not possible and an alternative discharge location is required.

Southern Testing have confirmed that the final ground investigation report will be issued once winter groundwater monitoring has been completed in April 2026.

Discharge to Watercourse

The applicant confirmed in an email dated 21st January 2026 that a drainage ditch is located in the west of the site and runs along the boundary line of two horse paddocks to the west of the sand school.

It has been confirmed that the section of drainage ditch which runs through the west of the site has a width of 1.20m and a depth of 0.8m.

The ditch is cleared annually and accepts runoff from the surrounding land.

EA LiDAR data has been used to estimate the cover and invert level of the eastmost (upstream) section of the ditch.

Based on Environment Agency LiDAR data, the upstream section of drainage ditch is conservatively estimated to have a cover and invert level of 73.40mAOD and 72.60mAOD, respectively.

According to the topographic survey, external ground levels adjacent to the steel-clad building and mono-pitch lean-to structure range between 75.25mAOD and 75.57mAOD.

As such, the invert level of the ditch is considered to be approximately 2.65m lower than the development area.

Given that the drainage ditch is elevated approximately 2.65m lower than land adjacent to the steel-clad building and mono-pitch lean-to it is considered that a gravity connection could be achieved to this feature from a SuDS system at the site.

The drainage ditch is located within the client's ownership boundary. Therefore, discharge to the ditch can be achieved without the need to obtain third party land owner permission to run infrastructure across land or for construction of a new outfall.

Despite this, given that the ditch connects to an Ordinary Watercourse, post development discharge of additional surface water flows into the ditch will be subject to receipt of Ordinary Watercourse Consent from West Sussex County Council.

Discharge to Sewer

An Asset Location Search has been obtained from Southern Water.

According to Southern Water records there are no main surface water sewers within vicinity to the site.

As such, discharge to sewer is not considered feasible and has not been considered further as part of this study.

Existing Runoff Rates

The FEH Statistical Method has been used to estimate the greenfield runoff rate for several return period events including QBAR.

Greenfield runoff rates have been calculated based on a site area of 44500m² and a development area of 550m².

Copies of the calculation sheets are included in Appendix D.

	Greenfield Runoff Rate (l/s)	
Storm Event	Whole Site	Development Area
QBAR	36.7	0.5
1 in 1 year	31.2	0.4
1 in 30 year	84.5	1.0
1 in 100 year	117.2	1.4

Table 4: Greenfield Runoff Rates

SuDS Scheme

The proposed planning application relates to retention of a recently built steel-clad barn building with lean-to situated in the north eastern corner of the Beckley Stud site.

According to plans submitted as part of application reference DC/22/0388, the steel-clad building and mono-pitch lean-to have a total built footprint of approximately 550m².

As such, this drainage strategy addresses how surface water runoff generated by 550m² of impermeable area can be managed.

It is proposed to manage post development surface water runoff from the steel-clad barn building and lean-to via a combination of rainwater butts (attached onto the existing downpipes) and a lined vegetated swale.

The proposed SuDS system has been designed to provide sufficient storage to accommodate all runoff generated by impermeable areas during the 1 in 100 year plus (45%) Climate Change event.

Surface water runoff generated by 550m² of roof area will initially be directed and stored in rainwater butts attached to the building downpipes.

Once the rainwater butts are at capacity water will be directed towards a swale located adjacent west of the sand school via subterranean pipework.

In accordance with the national standards for sustainable drainage systems (SuDS):

As a minimum, where the longitudinal gradient of a swale is less than 1:100 and has at least 500mm of suitable base material, swales are suitable for interception for impermeable surface areas up to 5 times the base of the vegetated surface area receiving the runoff, whether lined or unlined.

The swale has been designed so that it has a vegetated base area of 110m². As such, the SuDS will meet the interception requirements covered under Standard 2 of the national guidance.

From the swale water will be discharged at a controlled rate of 1.0 l/s into the drainage ditch located in the west of the site (subject to receipt of Ordinary Watercourse Consent from West Sussex County Council).

Limiting runoff to a maximum rate of 1.0l/s via hydro-brake equates to a 50mm diameter orifice with a 300mm head. In accordance with guidance a 50mm orifice diameter is considered the lowest practicable size to minimise the risk of blockage to the outflow control.

Outflow from the proposed SuDS system to the drainage ditch will be limited for all storms up to, and including, the 1 in 100yr plus (45%) Climate Change event via a flow control device (hydrobrake or similar).

Swales

According to plans provided by the applicant, an area of land which has no established tree coverage or buildings is located adjacent west of the sand school, between the development and the drainage ditch.

It is proposed that a lined swale is installed in this location with a vegetated base area of 110m².

Incorporation of a vegetated swale within the scheme will enable interception for the first 5mm of runoff and will provide biodiversity, amenity and water quality benefits.

A schematic of an example swale cross section is shown below.

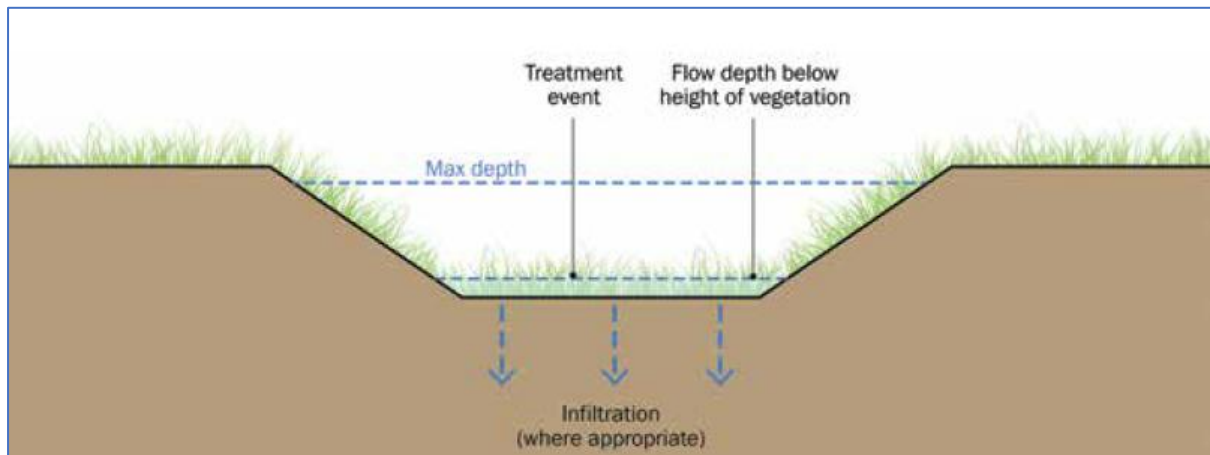


Figure 9: Attenuation Swale Schematic (Source: CIRIA SuDS Manual)

The swale has been sized to accommodate all surface water runoff generated by the building roof area during the 1 in 100yr +45% CC event whilst also provide interception and biodiversity benefits.

Incorporation of a swale within the proposals will enable the development to meet the new SuDS standards.

Design Exceedance

The proposed SuDS system has been designed to accommodate all surface water runoff generated by 550m² of impermeable surfacing during the 1 in 100yr plus (45%) Climate Change event.

As such, the SuDS system also has capacity to accommodate all runoff generated by the 1 in 30yr plus (40%) Climate Change rainfall event with no exceedance.

Despite this it is recommended that the profile of the site is designed to direct any exceedance surface water flows towards the formal drainage system.

Potential exceedance flow routes can be seen on the proposed SuDS layout plan in Appendix F.

Water Quality

In accordance with The Simple Index Approach, detailed in the CIRIA SuDS Manual, commercial / industrial roof runoff is considered to have a 'low' pollution hazard level (refer to Table 5).

Nevertheless, it is recommended that debris / sediment traps are included on any new drainage.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other Roofs (Commercial / Industrial Roofs)	Low	0.3	0.2	0.05

Table 5: Pollution Hazard Indices for Different Land Use Classifications

It is proposed to manage surface water runoff from the development via a combination of rainwater butts and a swale.

Indicative mitigation indices for the SuDS features are as follows:

Type of SuDS Component	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Swale	0.5	0.6	0.6

Table 6: Indicative SuDS Mitigation Indices for Discharges to Surface Waters

Scheme Dependencies

Post development discharge to the drainage ditch will be subject to:

- A topographic survey showing that there is sufficient fall at the site to allow a gravity connection into the receiving ditch
- Receipt of relevant consent(s) including Ordinary Watercourse Consent from West Sussex County Council

Adoption and Maintenance

It is foreseen that all SuDS components will be maintained privately by the future site owner(s) / operators or an appropriate management company.

All SuDS components should be maintained in line with the guidance provided in The SuDS Manual (C753). The following operation and maintenance requirements are recommended for the SuDS elements proposed in this strategy.

Drainage Infrastructure	Required Action	Typical Frequency
Conveyance Pipes	Inspect and remove silt/debris. Jet where appropriate.	To be inspected annually and as required.
Chambers and Catchpits	Inspect and remove silt/debris. Jet where appropriate. Replace damaged covers.	To be inspected annually and following a large storm event.
Flow Control and Associated Chamber	Inspect for blockages and clear where required. Remediate any faults.	To be inspected annually and following a large storm event.

Table 7: Suggested Maintenance Requirements for Drainage Infrastructure

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeded	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Table 8: Maintenance Requirements for Swales (Source: CIRIA SuDS Manual)

Conclusions

GeoSon Limited have been instructed by Equine America UK Ltd to undertake a Surface Water Drainage Strategy to support a retrospective planning application for development at Beckley Stud, Reeds Lane, Southwater, West Sussex RH13 9DQ.

This assessment has been undertaken in accordance with the revised National Planning Policy Framework (NPPF) December 2024, the associated Planning Practice Guidance (PPG), the CIRIA SuDS Manual c753 and the Sewers for Adoption guidance.

The retrospective application relates to retention of a steel-clad building and mono-pitch lean-to at Beckley Stud, Reeds Lane, Southwater, West Sussex RH13 9DQ.

The steel-clad barn style building is used by Equine America UK for the storage and distribution of stock. The building incorporates a 'lean-to' element on its southern elevation.

According to plans submitted as part of application reference DC/22/0388, the steel-clad building and mono-pitch lean-to have a total built footprint of approximately 550m².

As such, this drainage strategy addresses how surface water runoff generated by 550m² of impermeable area can be managed.

Having reviewed discharge options at the site, there are several constraints that need to be taken into consideration when designing the proposed SuDS scheme for the development.

In light of these, it is proposed to manage post development surface water runoff from the steel-clad barn building and lean-to via a combination of rainwater butts (attached onto the existing downpipes) and a lined vegetated swale.

Surface water runoff generated by 550m² of roof area will initially be directed and stored in rainwater butts attached to the building downpipes.

Once the rainwater butts are at capacity water will be directed towards a swale located adjacent west of the sand school via subterranean pipework.

The swale has been designed so that it has a vegetated base area of 110m². As such, the SuDS will meet the interception requirements covered under Standard 2 of the national guidance.

From the swale water will be discharged at a controlled rate of 1.0 l/s into the drainage ditch located in the west of the site (subject to receipt of Ordinary Watercourse Consent from West Sussex County Council).

Limiting runoff to a maximum rate of 1.0l/s via hydro-brake equates to a 50mm diameter orifice with a 300mm head. In accordance with guidance a 50mm orifice diameter is considered the lowest practicable size to minimise the risk of blockage to the outflow control.

Outflow from the proposed SuDS system to the drainage ditch will be limited for all storms up to, and including, the 1 in 100yr plus (45%) Climate Change event via a flow control device (hydrobrake or similar).

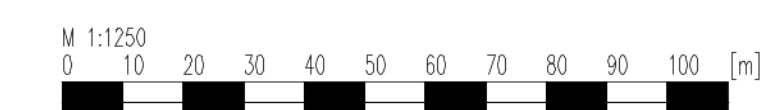
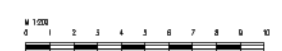
The proposed SuDS system has been designed to accommodate all surface water runoff generated by 550m² of impermeable surfacing during the 1 in 100yr plus (45%) Climate Change event. As such, the SuDS system also has capacity to accommodate all runoff generated by the 1 in 30yr plus (40%) Climate Change rainfall event with no exceedance.

The SuDS scheme is subject to the dependencies listed on Page 22.

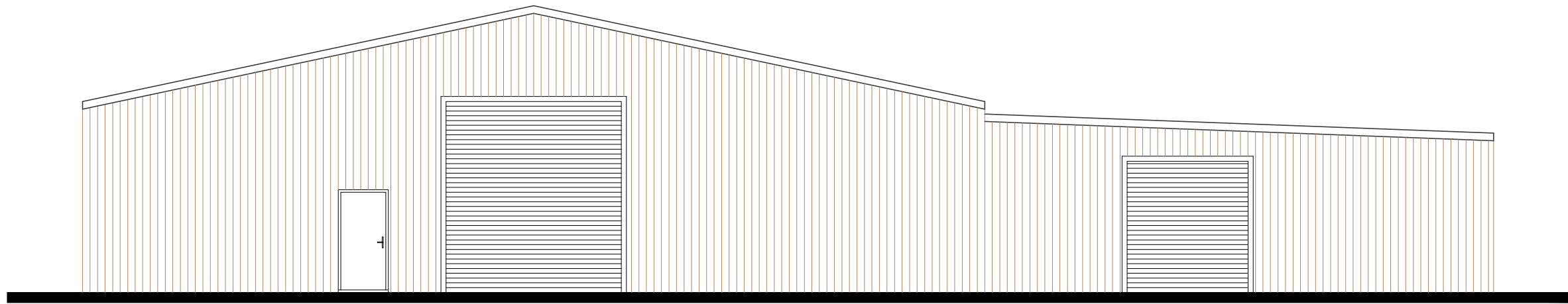
Appendix

- A. Existing Plans and Topographic Survey
- B. Southern Water Asset Location Search
- C. Southern Testing Preliminary Ground Investigation Results
- D. Greenfield Runoff Calculations
- E. Innovyze InfoDrainage Calculation Sheets – Discharge to Watercourse
- F. Proposed SuDS Layout Plan
- G. Example Rainwater Butt Product Sheet

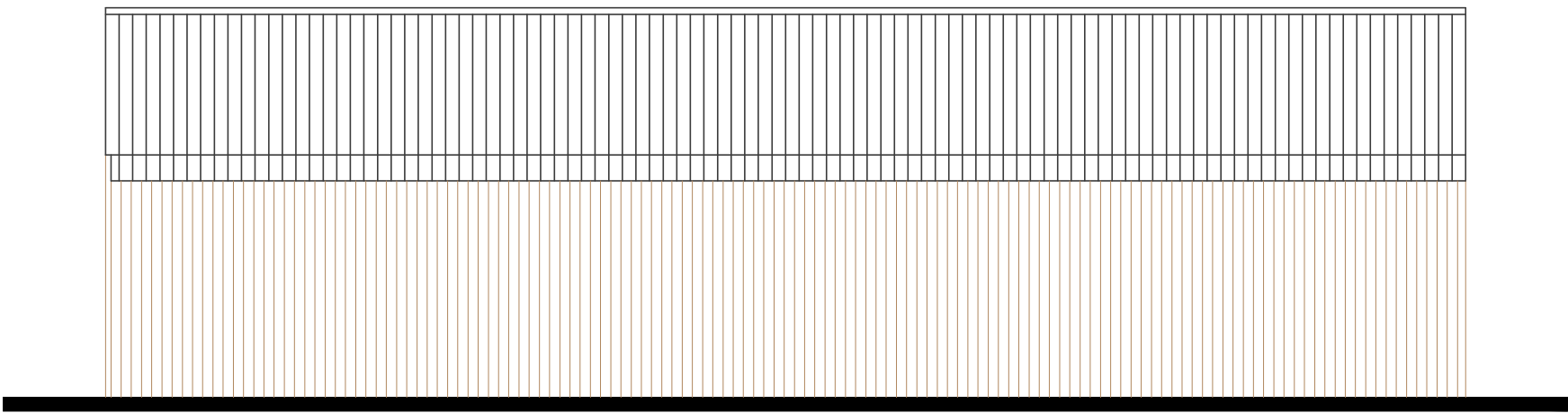
Appendix A



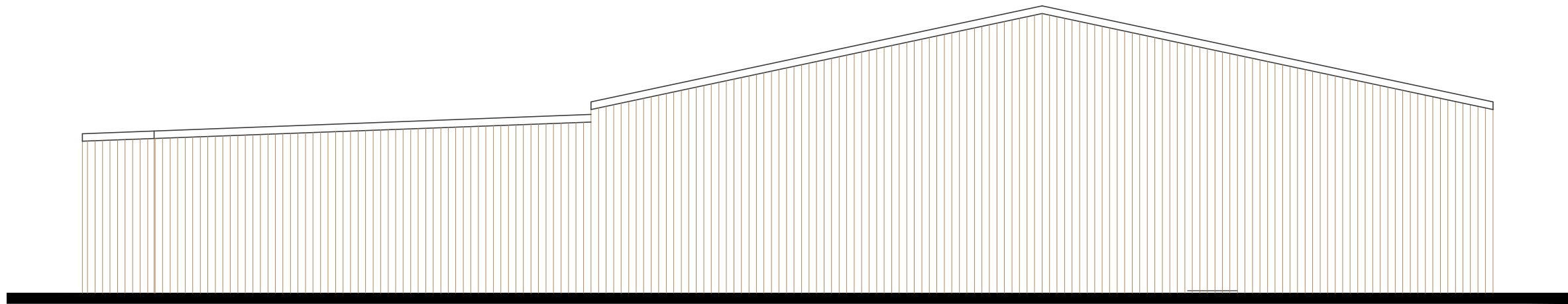
Drg. No.	Rev.
AG20815 - BS - 1098	



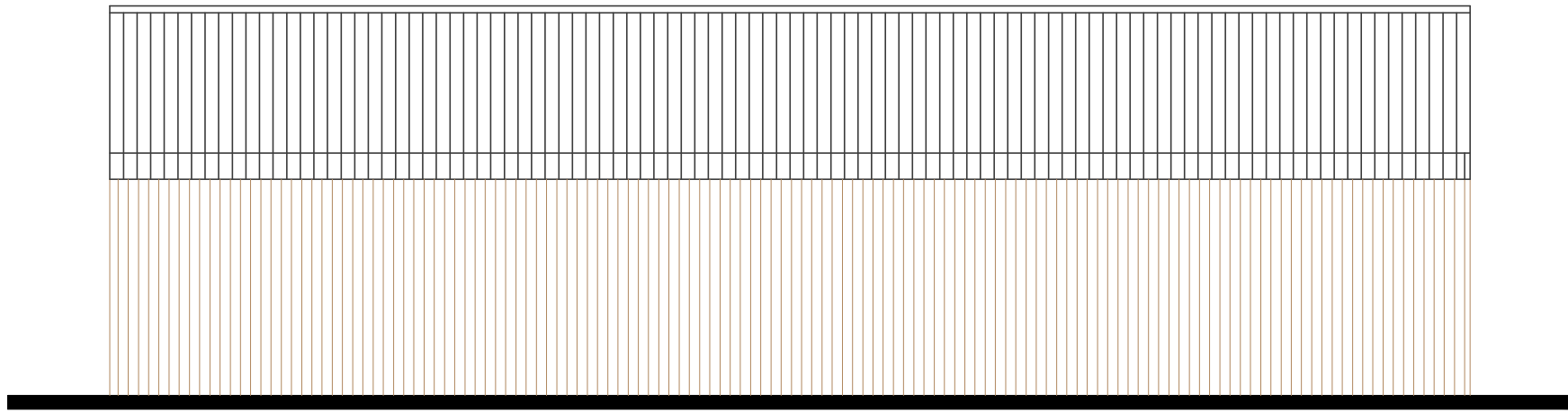
West Elevation
(1:100 @ A1)



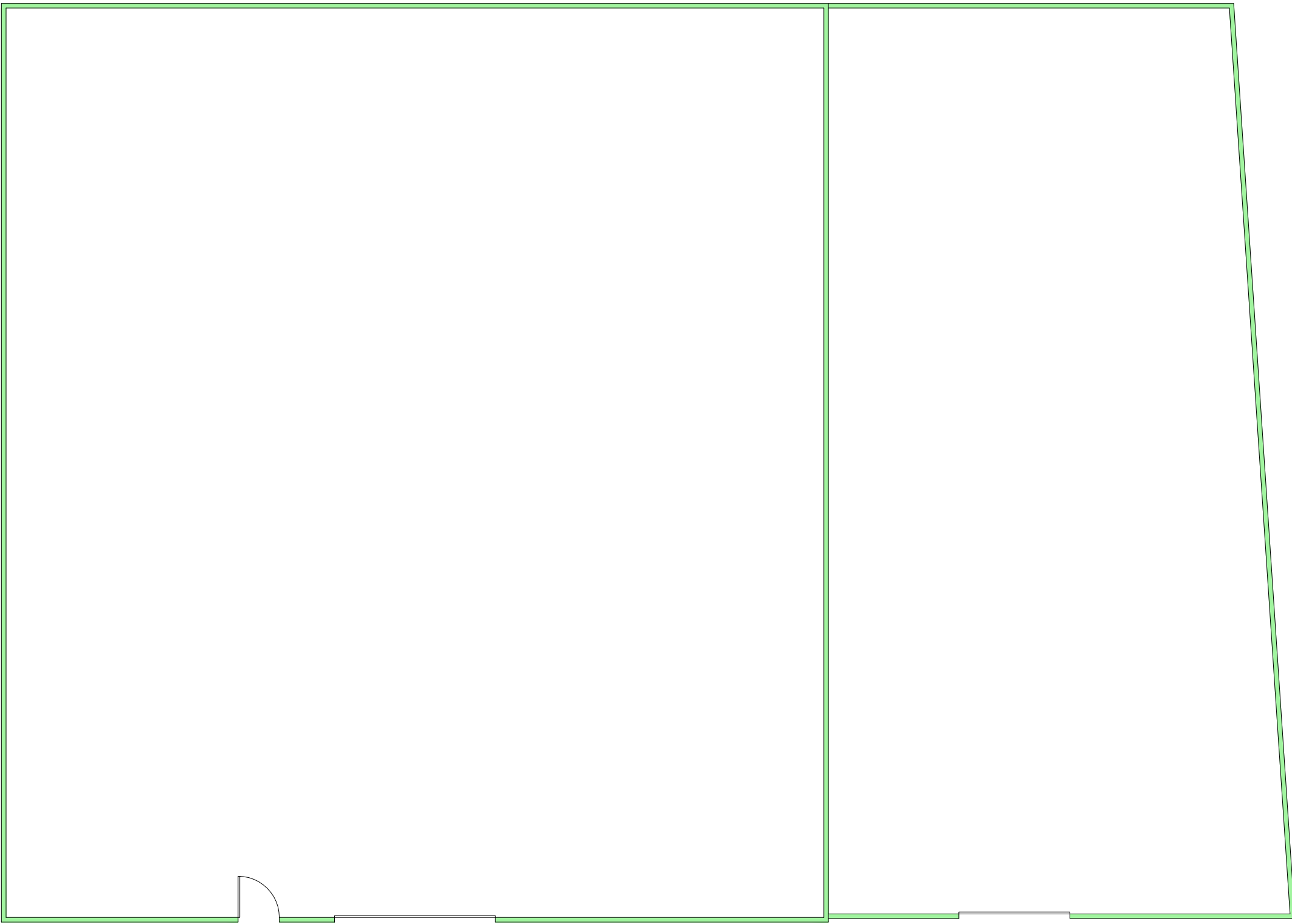
South Elevation
(1:100 @ A1)



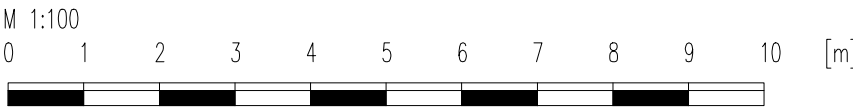
East Elevation
(1:100 @ A1)



North Elevation
(1:100 @ A1)



Ground Floor Plan
(1:100 @ A1)



Agrarian

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▀ **Surveying**

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Client
Mr Middleton
Care of Agent

Job Title
Works @
Beckley Stud
Reeds Lane
Southwater
RH13 9DQ

Drawing Title
Floor Plan & Elevations
Storage Building

Rev.	Date	Revisions
------	------	-----------

NOTES:
All dimensions must be checked on site.
Agrarian Ltd., believe that the shown dimensions are correct. The contractor must check all dimensions on the drawings against those on site, before commencing any work. Agrarian Ltd., will not be held liable for any inaccuracies found on the plan after the commencement of works.

Scale 1:100 @ A1	
Date Nov. 2021	Drawn By
Drg. No. AG20815 - BS - 10021	Rev.

Appendix B

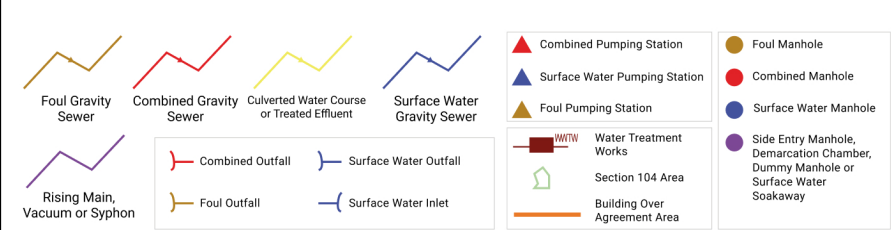


(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122 Date: 19/03/26 Scale: 1:1250 Map Centre: 516780,127855 Data updated: 22/02/26 Our Ref: 2064918 - 1 Wastewater Plan A2 Powered by digdat

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.



tom@geoson.co.uk
73541



Appendix C

Summary Sheet

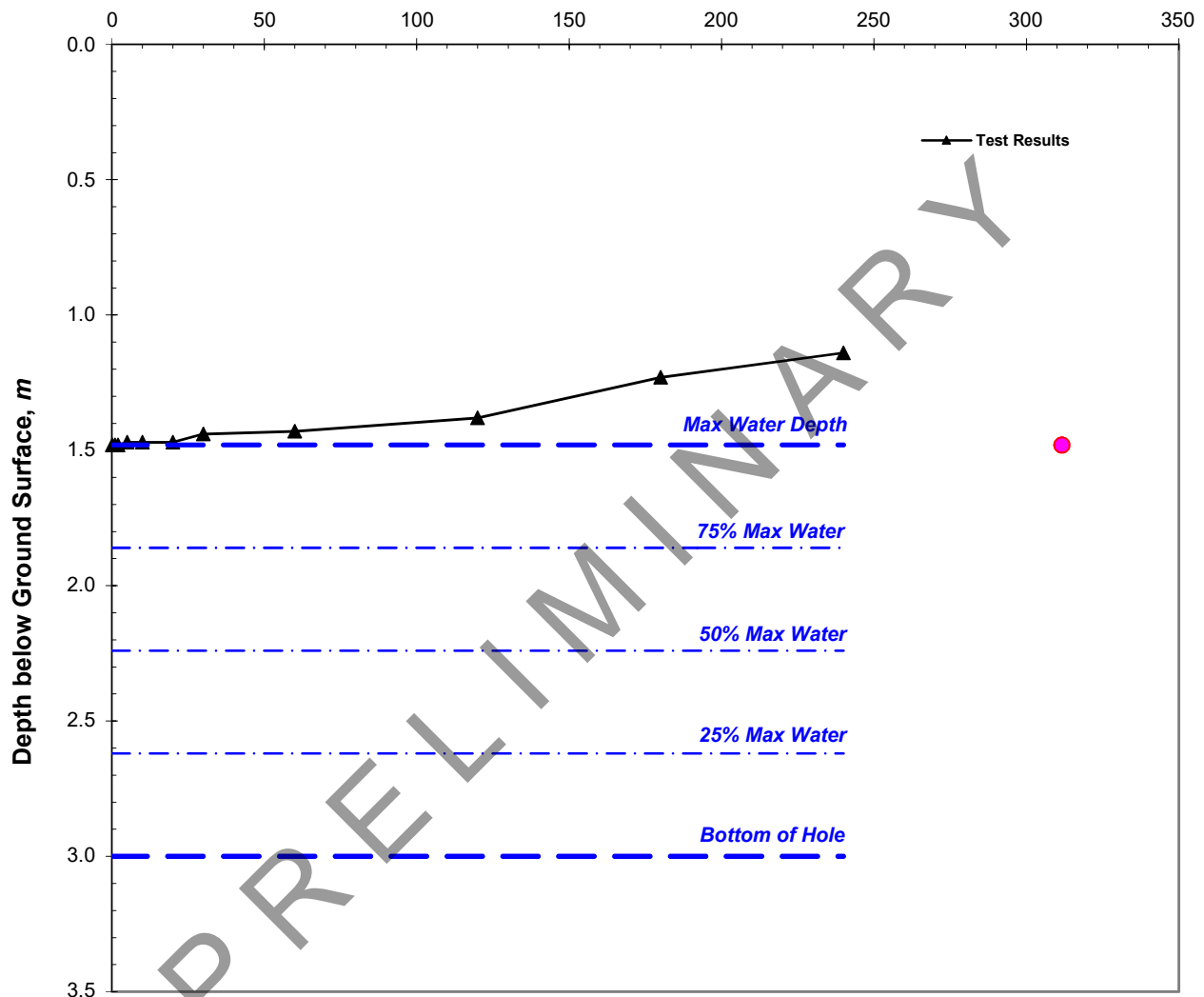
Results of BRE Digest DG365 Soakage Tests

Site : Beckley Stud				Job No : J16157			
Client : Equine America				O S Reference :			
Tested By : JS			Engineer: PJS		Test Date : 20/Jan/2026		
Hole No	Test No	Hole Depth <i>m</i>	Soakage Rate for Each Test <i>litre/m²/min</i>	Soakage Rate for Each Hole <i>litre/m²/min m/sec</i>		Water Level at Finish of Test	Remarks
TP1	No 1	3.00	N/A	N/A	N/A	Water level arose during test.	
TP2	No 1	2.80	N/A	N/A	N/A	Water level arose during test.	
TP3	No 1	2.70	N/A	N/A	N/A	Pit was not emptied; Non compliant value was calculated.	
Mean Value of All Calculated Soakage Rates :				N/A <i>litre/m²/min</i>	N/A <i>m/sec</i>		

BRE Digest DG365 Soakage Test

Test Hole No: TP1
Test No: Test No 1 (Initial)

Time from Filling to Maximum Water Depth, *minute*



Pit Length, m	2.500	Depth to Water at Start of Test, m	1.480
Pit Width, m	0.450	Max Water Dropdown during Test, m	0.000
Depth to Pit Base, m	3.000	Total Soakage Test Time, min	240.0
Depth to Top of Permeable Soils, m		Mean Internal Discharge Area, m ²	10.093
Depth to Groundwater Surface, m		Discharge Rate, litre/min	
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	N/A
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	N/A

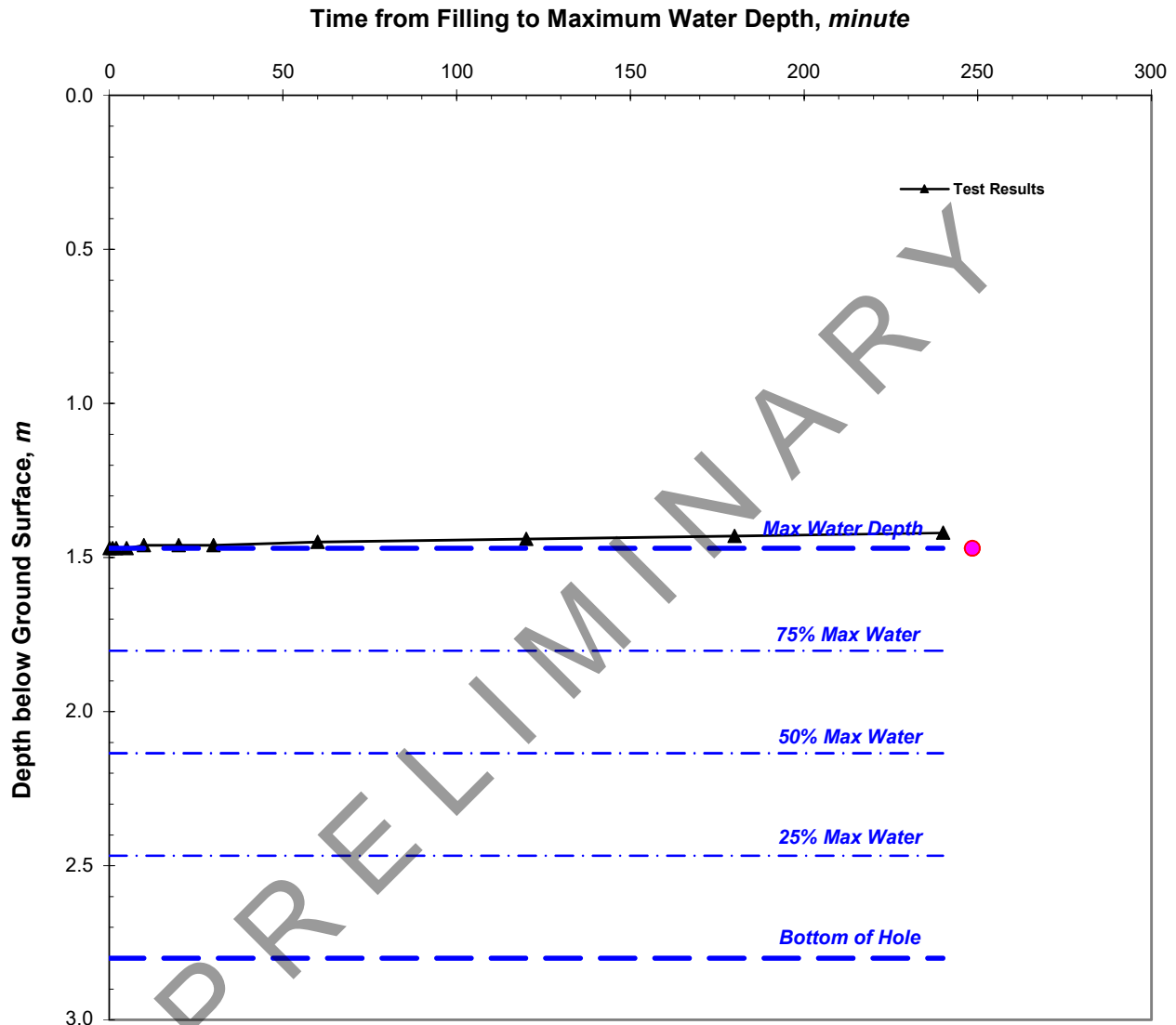
Comments:

Water level arose during the test, soakage rate calculation is not applicable.

Client: Equine America	Job No: J16157	Test Date: 20/01/2026
Site: Beckley Stud	Tested By: JS	Engineer: PJS
		Fig. S1

BRE Digest DG365 Soakage Test

Test Hole No: TP2
Test No: Test No 1 (Initial)



Pit Length, m	2.300	Depth to Water at Start of Test, m	1.470
Pit Width, m	0.450	Max Water Dropdown during Test, m	0.000
Depth to Pit Base, m	2.800	Total Soakage Test Time, min	240.0
Depth to Top of Permeable Soils, m		Mean Internal Discharge Area, m ²	8.350
Depth to Groundwater Surface, m		Discharge Rate, litre/min	
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	N/A
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	N/A

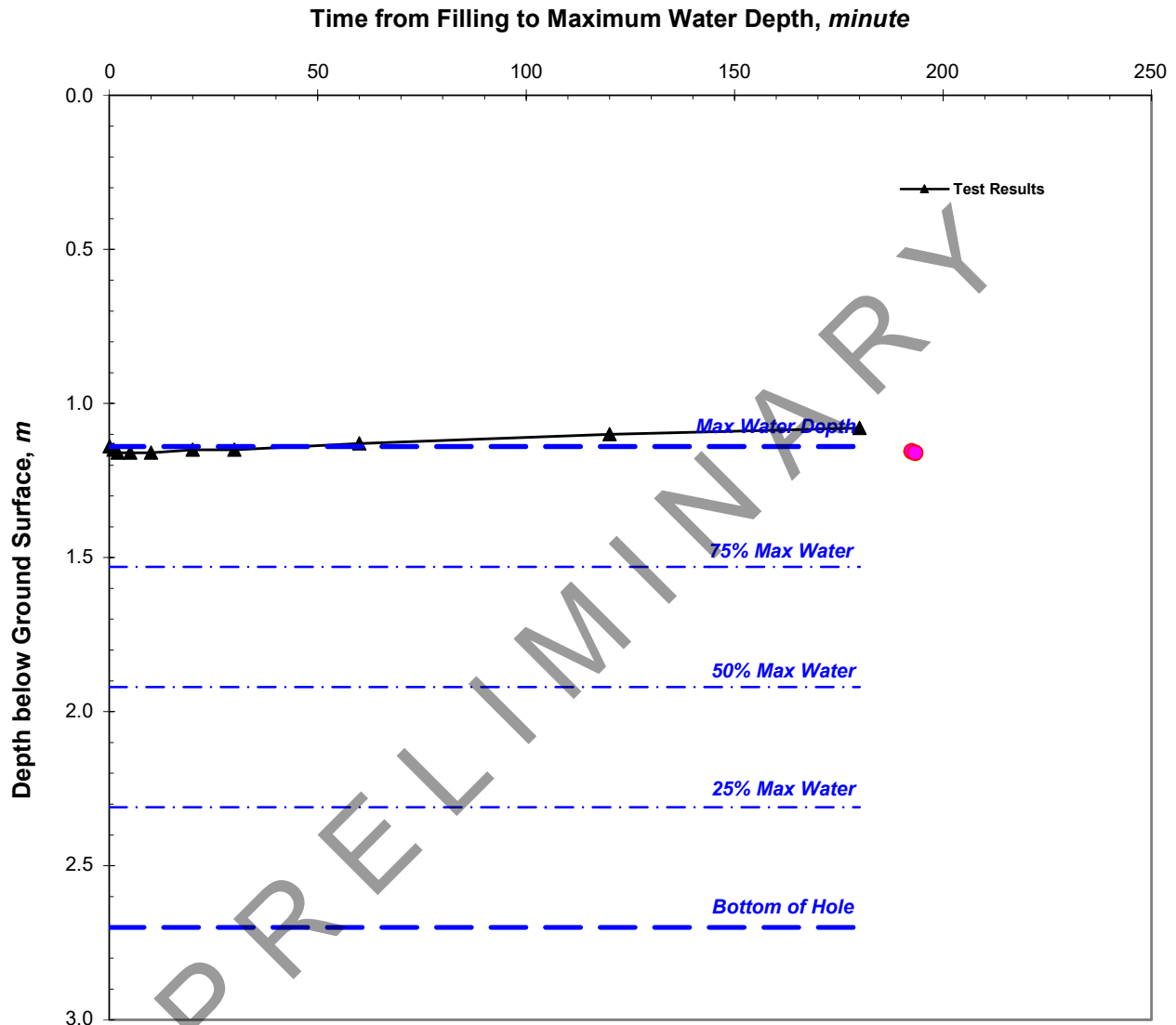
Comments:

Water level arose during the test, soakage rate calculation is not applicable.

Client: Equine America	Job No: J16157	Test Date: 20/01/2026
Site: Beckley Stud	Tested By: JS	Engineer: PJS
		Fig. S2

BRE Digest DG365 Soakage Test

Test Hole No: TP3
Test No: Test No 1 (Initial)



Pit Length, m	2.300	Depth to Water at Start of Test, m	1.140
Pit Width, m	0.450	Max Water Dropdown during Test, m	0.020
Depth to Pit Base, m	2.700	Total Soakage Test Time, min	180.0
Depth to Top of Permeable Soils, m		Mean Internal Discharge Area, m ²	9.519
Depth to Groundwater Surface, m		Discharge Rate, litre/min	
Depth to Top of Granular Fill, m		Soakage Rate, litre/m ² /min	N/A
Voids Assumed for Granular Fill, %	100%	BRE Soil Infiltration Rate, m/sec	N/A

Comments:

Water level arose during the test, soakage rate calculation is not applicable.

Client: Equine America	Job No: J16157	Test Date: 20/01/2026
Site: Beckley Stud	Tested By: JS	Engineer: PJS Fig. S3

Appendix D

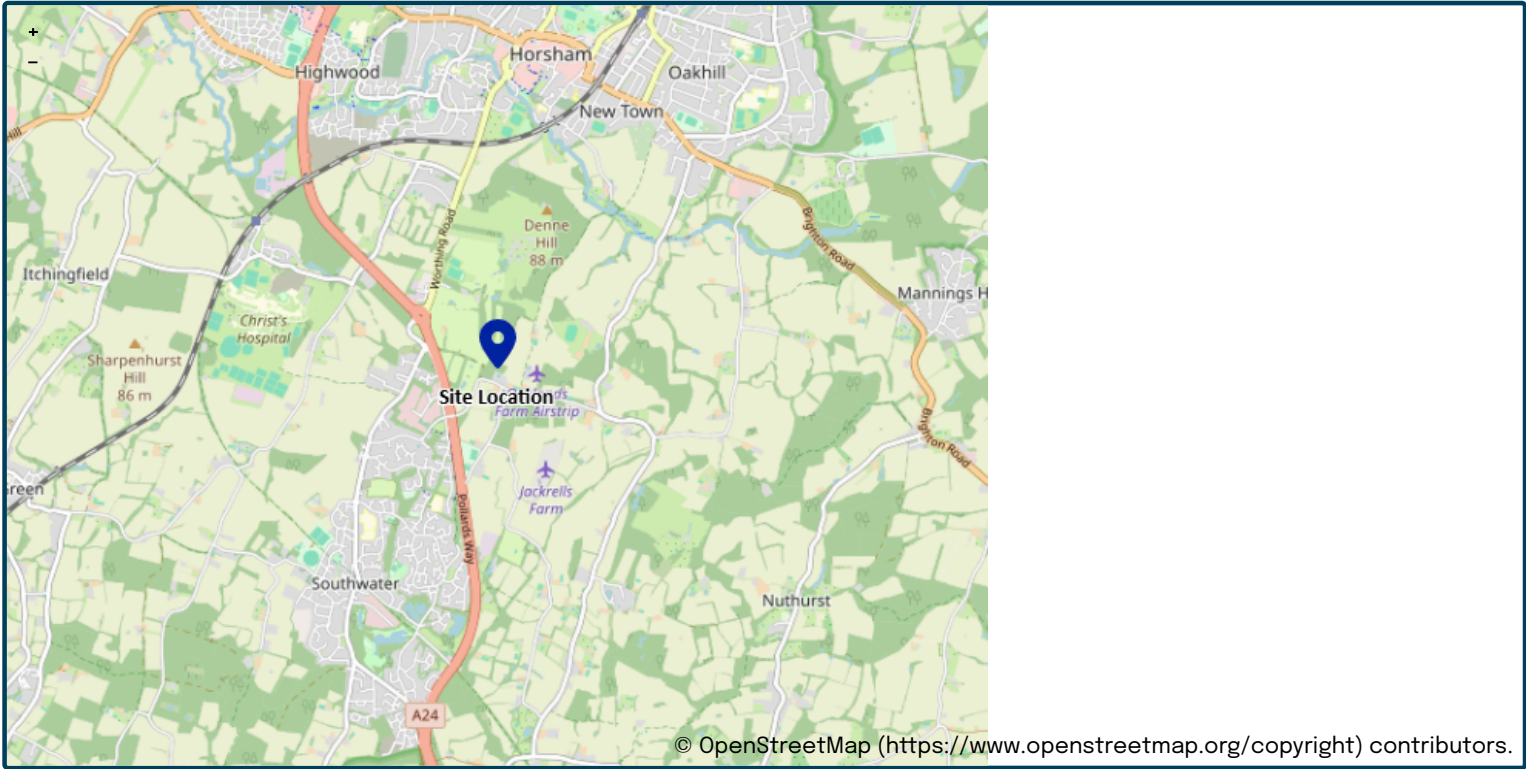
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	02/03/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	Beckley Stud
Site location	



Site easting (British National Grid)	516776
Site northing (British National Grid)	127873

Site details

Total site area (ha)	0.055	ha
----------------------	------------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	-----------------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	821 mm	
BFIHOST19scaled	0.265	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	0.4 l/s	
QBar (FEH statistical 2025) (l/s)	0.5 l/s	

Growth curve factors

	<u>My value</u>	<u>Map value</u>
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	FEH statistical (2025)
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)	1.4 l/s
Flow rate 200 years (l/s)	1.7 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 uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.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.

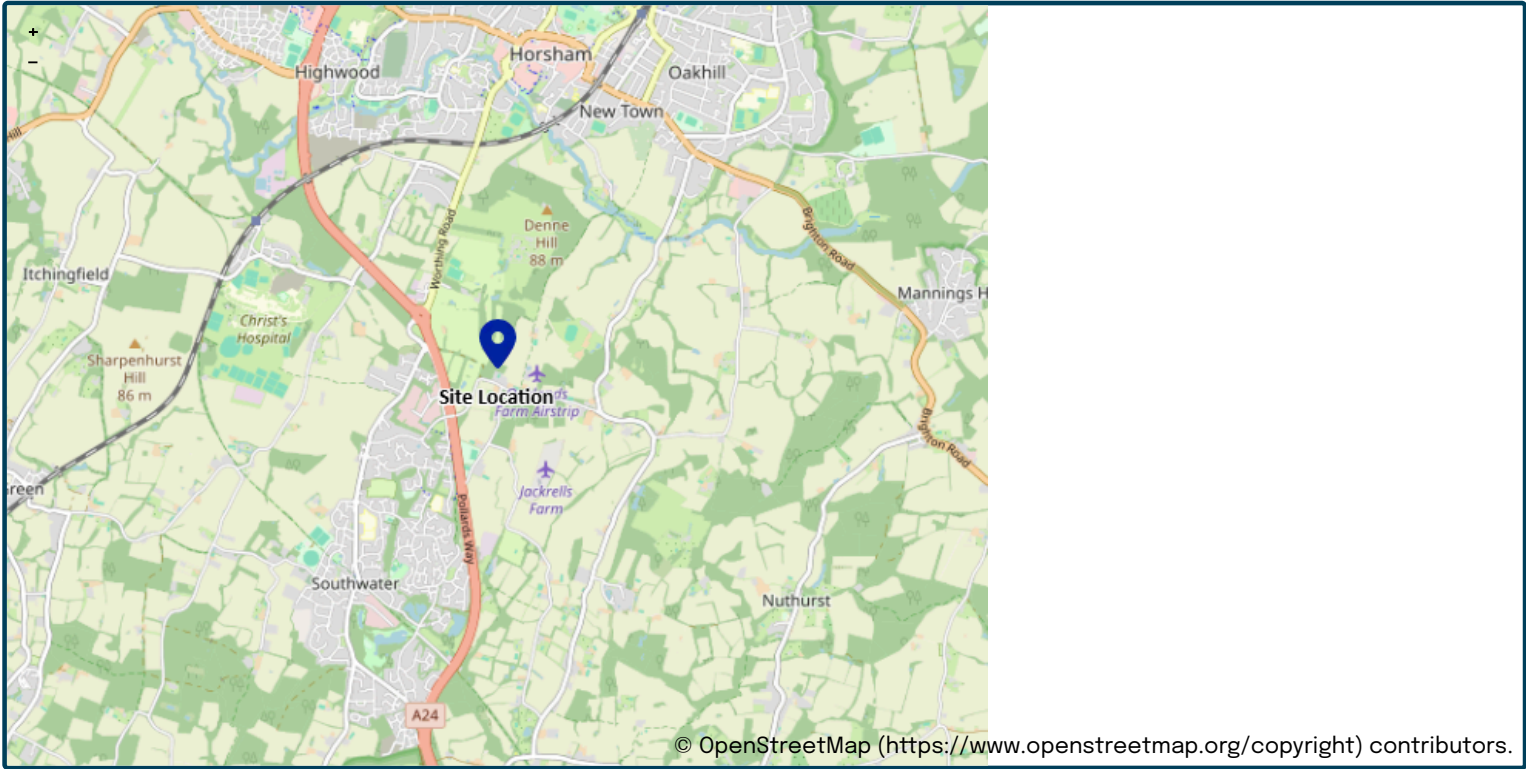
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	02/03/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	Beckley Stud
Site location	



Site easting (British National Grid)	516776
Site northing (British National Grid)	127873

Site details

Total site area (ha)	4.45	ha
----------------------	-----------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	821	mm
BFIHOST19scaled	0.265	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	32.3	l/s
QBar (FEH statistical 2025) (l/s)	36.7	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
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	FEH statistical (2025)
Flow rate 1 year (l/s)	31.2
Flow rate 2 year (l/s)	32.3
Flow rate 10 years (l/s)	59.5
Flow rate 30 years (l/s)	84.5
Flow rate 100 years (l/s)	117.2
Flow rate 200 years (l/s)	137.4

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

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Appendix E

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale	Date: 24/03/2026			
Report Details: Type: Inflows Storm Phase: Phase	Designed by: TS	Checked by:	Approved By:	
Company Address: GeoSon Limited				



Catchment Area

Type : Catchment Area

Area (ha)	0.055
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
		Designed by: TS	Checked by:		Approved By:
Report Details: Type: Junctions Storm Phase: Phase		Company Address: GeoSon Limited			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Manhole	Manhole	208550.307	601569.199	75.470	1.000	74.470	Circular	1.200
Manhole (1)	Manhole	208577.073	601566.005	75.380	1.180	74.200	Circular	1.200
Manhole (2)	Manhole	208602.977	601562.320	74.750	1.050	73.700	Circular	1.200
Manhole (3)	Manhole	208640.129	601557.853	74.000	0.600	73.400	Circular	1.200

Name	Lock
Manhole	None
Manhole (1)	None
Manhole (2)	None
Manhole (3)	None

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale	Date: 24/03/2026		
	Designed by: TS	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: GeoSon Limited		



Swale

Type : Swale

Swale

Exceedance Level (m)	73.600
Depth (m)	0.500
Base Level (m)	73.100
Top Width (m)	5.000
Side Slope (1:X)	3.00
Base Width (m)	2.000
Freeboard (mm)	150
Length (m)	55.000
Long. Slope (1:X)	275.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	58.712

Inlets

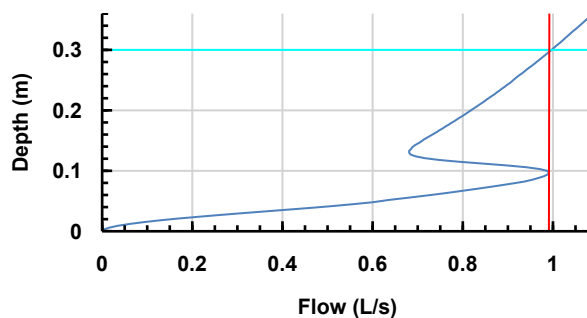
Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (3)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®
Invert Level (m)	73.100
Design Depth (m)	0.300
Design Flow (L/s)	1.0
Objective	Minimise Blockage Risk
Application	Surface Water Only
Sump Available	☐
Unit Reference	CCL-0050-1000-0300-1000



Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale	Date: 24/03/2026			
Report Details: Type: Stormwater Controls Storm Phase: Phase	Designed by: TS		Checked by:	Approved By:
Company Address: GeoSon Limited				

Advanced	
Swale	
Porosity (%)	100

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
		Designed by: TS	Checked by:		Approved By:
Report Details: Type: Connections Storm Phase: Phase		Company Address: GeoSon Limited			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
Pipe	26.956	Pipe	99.837		0.6	225	75.470	74.470
Pipe (1)	26.164	Pipe	52.328		0.6	225	75.380	74.200
Pipe (2)	37.420	Pipe	124.733		0.6	225	74.750	73.700
Pipe (3)	10.683	Pipe	106.833		0.6	225	74.000	73.400

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock
Pipe	75.380	74.200		None
Pipe (1)	74.750	73.700		None
Pipe (2)	74.000	73.400		None
Pipe (3)	73.800	73.300		None

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale	Date: 24/03/2026					
Report Title: Rainfall Analysis Criteria	Designed by: TS <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <td>Checked by:</td> <td>Approved By:</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>		Checked by:	Approved By:		
Checked by:	Approved By:					
	Company Address: GeoSon Limited					

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall		
FEH (1)	Type: FEH	
Site Location	GB 515000 127350 TQ 15000 27350	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole: Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH (1): 30 years: +40 %: 15 mins: Summer	75.47 0	74.47 0	74.593	0.123	27.6	0.139	0.000	26.8	12.022	OK
FEH (1): 30 years: +40 %: 15 mins: Winter	75.47 0	74.47 0	74.597	0.127	29.0	0.143	0.000	28.2	13.466	OK
FEH (1): 30 years: +40 %: 30 mins: Summer	75.47 0	74.47 0	74.567	0.097	18.4	0.110	0.000	18.4	15.930	OK
FEH (1): 30 years: +40 %: 30 mins: Winter	75.47 0	74.47 0	74.570	0.100	19.3	0.113	0.000	19.3	17.837	OK
FEH (1): 30 years: +40 %: 60 mins: Summer	75.47 0	74.47 0	74.561	0.091	16.2	0.102	0.000	16.2	20.227	OK
FEH (1): 30 years: +40 %: 60 mins: Winter	75.47 0	74.47 0	74.556	0.086	14.6	0.097	0.000	14.6	22.659	OK
FEH (1): 30 years: +40 %: 120 mins: Summer	75.47 0	74.47 0	74.546	0.076	11.6	0.086	0.000	11.6	24.498	OK
FEH (1): 30 years: +40 %: 120 mins: Winter	75.47 0	74.47 0	74.537	0.067	9.4	0.076	0.000	9.4	27.439	OK
FEH (1): 30 years: +40 %: 180 mins: Summer	75.47 0	74.47 0	74.536	0.066	9.1	0.075	0.000	9.1	27.062	OK
FEH (1): 30 years: +40 %: 180 mins: Winter	75.47 0	74.47 0	74.528	0.058	7.0	0.066	0.000	7.0	30.313	OK
FEH (1): 30 years: +40 %: 240 mins: Summer	75.47 0	74.47 0	74.530	0.060	7.5	0.068	0.000	7.5	28.915	OK
FEH (1): 30 years: +40 %: 240 mins: Winter	75.47 0	74.47 0	74.522	0.052	5.6	0.059	0.000	5.6	32.383	OK
FEH (1): 30 years: +40 %: 360 mins: Summer	75.47 0	74.47 0	74.522	0.052	5.6	0.058	0.000	5.6	31.574	OK
FEH (1): 30 years: +40 %: 360 mins: Winter	75.47 0	74.47 0	74.514	0.044	4.1	0.050	0.000	4.1	35.352	OK
FEH (1): 30 years: +40 %: 480 mins: Summer	75.47 0	74.47 0	74.517	0.047	4.5	0.053	0.000	4.5	33.433	OK
FEH (1): 30 years: +40 %: 480 mins: Winter	75.47 0	74.47 0	74.510	0.040	3.3	0.045	0.000	3.3	37.440	OK
FEH (1): 30 years: +40 %: 600 mins: Summer	75.47 0	74.47 0	74.513	0.043	3.8	0.048	0.000	3.8	34.915	OK
FEH (1): 30 years: +40 %: 600 mins: Winter	75.47 0	74.47 0	74.506	0.036	2.8	0.041	0.000	2.8	39.097	OK
FEH (1): 30 years: +40 %: 720 mins: Summer	75.47 0	74.47 0	74.510	0.040	3.3	0.045	0.000	3.3	36.157	OK
FEH (1): 30 years: +40 %: 720 mins: Winter	75.47 0	74.47 0	74.504	0.034	2.4	0.038	0.000	2.4	40.518	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH (1): 30 years: +40 %: 960 mins: Summer	75.47 0	74.47 0	74.505	0.035	2.6	0.040	0.000	2.6	38.203	OK
FEH (1): 30 years: +40 %: 960 mins: Winter	75.47 0	74.47 0	74.500	0.030	1.9	0.034	0.000	1.9	42.798	OK
FEH (1): 30 years: +40 %: 1440 mins: Summer	75.47 0	74.47 0	74.500	0.030	1.9	0.034	0.000	1.9	41.437	OK
FEH (1): 30 years: +40 %: 1440 mins: Winter	75.47 0	74.47 0	74.496	0.026	1.4	0.029	0.000	1.4	46.368	OK
FEH (1): 30 years: +40 %: 2160 mins: Summer	75.47 0	74.47 0	74.496	0.026	1.4	0.029	0.000	1.4	45.042	OK
FEH (1): 30 years: +40 %: 2160 mins: Winter	75.47 0	74.47 0	74.492	0.022	1.0	0.025	0.000	1.0	50.412	OK
FEH (1): 30 years: +40 %: 2880 mins: Summer	75.47 0	74.47 0	74.493	0.023	1.1	0.026	0.000	1.1	48.126	OK
FEH (1): 30 years: +40 %: 2880 mins: Winter	75.47 0	74.47 0	74.490	0.020	0.8	0.023	0.000	0.8	53.922	OK
FEH (1): 30 years: +40 %: 4320 mins: Summer	75.47 0	74.47 0	74.490	0.020	0.8	0.023	0.000	0.8	53.616	OK
FEH (1): 30 years: +40 %: 4320 mins: Winter	75.47 0	74.47 0	74.487	0.017	0.6	0.020	0.000	0.6	59.940	OK
FEH (1): 30 years: +40 %: 5760 mins: Summer	75.47 0	74.47 0	74.488	0.018	0.7	0.021	0.000	0.7	58.542	OK
FEH (1): 30 years: +40 %: 5760 mins: Winter	75.47 0	74.47 0	74.486	0.016	0.5	0.018	0.000	0.5	65.316	OK
FEH (1): 30 years: +40 %: 7200 mins: Summer	75.47 0	74.47 0	74.487	0.017	0.6	0.019	0.000	0.6	63.090	OK
FEH (1): 30 years: +40 %: 7200 mins: Winter	75.47 0	74.47 0	74.485	0.015	0.4	0.017	0.000	0.4	70.518	OK
FEH (1): 30 years: +40 %: 8640 mins: Summer	75.47 0	74.47 0	74.486	0.016	0.5	0.018	0.000	0.5	67.698	OK
FEH (1): 30 years: +40 %: 8640 mins: Winter	75.47 0	74.47 0	74.484	0.014	0.4	0.016	0.000	0.4	76.386	OK
FEH (1): 30 years: +40 %: 10080 mins: Summer	75.47 0	74.47 0	74.486	0.016	0.5	0.018	0.000	0.5	72.084	OK
FEH (1): 30 years: +40 %: 10080 mins: Winter	75.47 0	74.47 0	74.484	0.014	0.3	0.015	0.000	0.3	81.168	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (1): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH (1): 30 years: +40 %: 15 mins: Summer	75.38 0	74.20 0	74.295	0.095	26.8	0.107	0.000	25.7	12.004	OK
FEH (1): 30 years: +40 %: 15 mins: Winter	75.38 0	74.20 0	74.298	0.098	28.2	0.111	0.000	27.1	13.448	OK
FEH (1): 30 years: +40 %: 30 mins: Summer	75.38 0	74.20 0	74.277	0.077	18.4	0.088	0.000	18.4	15.921	OK
FEH (1): 30 years: +40 %: 30 mins: Winter	75.38 0	74.20 0	74.280	0.080	19.3	0.090	0.000	19.3	17.828	OK
FEH (1): 30 years: +40 %: 60 mins: Summer	75.38 0	74.20 0	74.272	0.072	16.2	0.082	0.000	16.2	20.224	OK
FEH (1): 30 years: +40 %: 60 mins: Winter	75.38 0	74.20 0	74.269	0.069	14.6	0.078	0.000	14.6	22.656	OK
FEH (1): 30 years: +40 %: 120 mins: Summer	75.38 0	74.20 0	74.261	0.061	11.6	0.069	0.000	11.6	24.496	OK
FEH (1): 30 years: +40 %: 120 mins: Winter	75.38 0	74.20 0	74.255	0.055	9.4	0.062	0.000	9.4	27.438	OK
FEH (1): 30 years: +40 %: 180 mins: Summer	75.38 0	74.20 0	74.254	0.054	9.1	0.061	0.000	9.1	27.060	OK
FEH (1): 30 years: +40 %: 180 mins: Winter	75.38 0	74.20 0	74.247	0.047	7.0	0.053	0.000	7.0	30.312	OK
FEH (1): 30 years: +40 %: 240 mins: Summer	75.38 0	74.20 0	74.249	0.049	7.5	0.055	0.000	7.5	28.914	OK
FEH (1): 30 years: +40 %: 240 mins: Winter	75.38 0	74.20 0	74.242	0.042	5.6	0.048	0.000	5.6	32.382	OK
FEH (1): 30 years: +40 %: 360 mins: Summer	75.38 0	74.20 0	74.242	0.042	5.6	0.048	0.000	5.6	31.573	OK
FEH (1): 30 years: +40 %: 360 mins: Winter	75.38 0	74.20 0	74.236	0.036	4.1	0.041	0.000	4.1	35.352	OK
FEH (1): 30 years: +40 %: 480 mins: Summer	75.38 0	74.20 0	74.238	0.038	4.5	0.043	0.000	4.5	33.432	OK
FEH (1): 30 years: +40 %: 480 mins: Winter	75.38 0	74.20 0	74.233	0.033	3.3	0.037	0.000	3.3	37.440	OK
FEH (1): 30 years: +40 %: 600 mins: Summer	75.38 0	74.20 0	74.235	0.035	3.8	0.040	0.000	3.8	34.914	OK
FEH (1): 30 years: +40 %: 600 mins: Winter	75.38 0	74.20 0	74.230	0.030	2.8	0.034	0.000	2.8	39.096	OK
FEH (1): 30 years: +40 %: 720 mins: Summer	75.38 0	74.20 0	74.233	0.033	3.3	0.037	0.000	3.3	36.156	OK
FEH (1): 30 years: +40 %: 720 mins: Winter	75.38 0	74.20 0	74.228	0.028	2.4	0.032	0.000	2.4	40.518	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH (1): 30 years: +40 %: 960 mins: Summer	75.38 0	74.20 0	74.229	0.029	2.6	0.033	0.000	2.6	38.202	OK
FEH (1): 30 years: +40 %: 960 mins: Winter	75.38 0	74.20 0	74.225	0.025	1.9	0.028	0.000	1.9	42.798	OK
FEH (1): 30 years: +40 %: 1440 mins: Summer	75.38 0	74.20 0	74.225	0.025	1.9	0.028	0.000	1.9	41.436	OK
FEH (1): 30 years: +40 %: 1440 mins: Winter	75.38 0	74.20 0	74.221	0.021	1.4	0.024	0.000	1.4	46.368	OK
FEH (1): 30 years: +40 %: 2160 mins: Summer	75.38 0	74.20 0	74.221	0.021	1.4	0.024	0.000	1.4	45.042	OK
FEH (1): 30 years: +40 %: 2160 mins: Winter	75.38 0	74.20 0	74.218	0.018	1.0	0.021	0.000	1.0	50.412	OK
FEH (1): 30 years: +40 %: 2880 mins: Summer	75.38 0	74.20 0	74.219	0.019	1.1	0.022	0.000	1.1	48.126	OK
FEH (1): 30 years: +40 %: 2880 mins: Winter	75.38 0	74.20 0	74.217	0.017	0.8	0.019	0.000	0.8	53.922	OK
FEH (1): 30 years: +40 %: 4320 mins: Summer	75.38 0	74.20 0	74.217	0.017	0.8	0.019	0.000	0.8	53.616	OK
FEH (1): 30 years: +40 %: 4320 mins: Winter	75.38 0	74.20 0	74.215	0.015	0.6	0.016	0.000	0.6	59.939	OK
FEH (1): 30 years: +40 %: 5760 mins: Summer	75.38 0	74.20 0	74.215	0.015	0.7	0.017	0.000	0.7	58.542	OK
FEH (1): 30 years: +40 %: 5760 mins: Winter	75.38 0	74.20 0	74.213	0.013	0.5	0.015	0.000	0.5	65.315	OK
FEH (1): 30 years: +40 %: 7200 mins: Summer	75.38 0	74.20 0	74.214	0.014	0.6	0.016	0.000	0.6	63.090	OK
FEH (1): 30 years: +40 %: 7200 mins: Winter	75.38 0	74.20 0	74.212	0.012	0.4	0.014	0.000	0.4	70.517	OK
FEH (1): 30 years: +40 %: 8640 mins: Summer	75.38 0	74.20 0	74.214	0.014	0.5	0.015	0.000	0.5	67.698	OK
FEH (1): 30 years: +40 %: 8640 mins: Winter	75.38 0	74.20 0	74.212	0.012	0.4	0.013	0.000	0.4	76.386	OK
FEH (1): 30 years: +40 %: 10080 mins: Summer	75.38 0	74.20 0	74.213	0.013	0.5	0.015	0.000	0.5	72.084	OK
FEH (1): 30 years: +40 %: 10080 mins: Winter	75.38 0	74.20 0	74.211	0.011	0.3	0.013	0.000	0.3	81.168	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (2): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH (1): 30 years: +40 %: 15 mins: Summer	74.75 0	73.70 0	73.820	0.120	25.7	0.136	0.000	23.7	11.981	OK
FEH (1): 30 years: +40 %: 15 mins: Winter	74.75 0	73.70 0	73.825	0.125	27.1	0.141	0.000	25.3	13.423	OK
FEH (1): 30 years: +40 %: 30 mins: Summer	74.75 0	73.70 0	73.801	0.101	18.4	0.115	0.000	18.4	15.911	OK
FEH (1): 30 years: +40 %: 30 mins: Winter	74.75 0	73.70 0	73.804	0.104	19.3	0.118	0.000	19.3	17.818	OK
FEH (1): 30 years: +40 %: 60 mins: Summer	74.75 0	73.70 0	73.794	0.094	16.2	0.106	0.000	16.2	20.217	OK
FEH (1): 30 years: +40 %: 60 mins: Winter	74.75 0	73.70 0	73.789	0.089	14.6	0.100	0.000	14.6	22.650	OK
FEH (1): 30 years: +40 %: 120 mins: Summer	74.75 0	73.70 0	73.778	0.078	11.6	0.088	0.000	11.6	24.494	OK
FEH (1): 30 years: +40 %: 120 mins: Winter	74.75 0	73.70 0	73.770	0.070	9.4	0.079	0.000	9.4	27.436	OK
FEH (1): 30 years: +40 %: 180 mins: Summer	74.75 0	73.70 0	73.768	0.068	9.1	0.077	0.000	9.1	27.059	OK
FEH (1): 30 years: +40 %: 180 mins: Winter	74.75 0	73.70 0	73.760	0.060	7.0	0.067	0.000	7.0	30.311	OK
FEH (1): 30 years: +40 %: 240 mins: Summer	74.75 0	73.70 0	73.762	0.062	7.5	0.070	0.000	7.5	28.913	OK
FEH (1): 30 years: +40 %: 240 mins: Winter	74.75 0	73.70 0	73.753	0.053	5.6	0.060	0.000	5.6	32.381	OK
FEH (1): 30 years: +40 %: 360 mins: Summer	74.75 0	73.70 0	73.753	0.053	5.6	0.060	0.000	5.6	31.573	OK
FEH (1): 30 years: +40 %: 360 mins: Winter	74.75 0	73.70 0	73.745	0.045	4.1	0.051	0.000	4.1	35.351	OK
FEH (1): 30 years: +40 %: 480 mins: Summer	74.75 0	73.70 0	73.748	0.048	4.5	0.054	0.000	4.5	33.433	OK
FEH (1): 30 years: +40 %: 480 mins: Winter	74.75 0	73.70 0	73.741	0.041	3.3	0.046	0.000	3.3	37.440	OK
FEH (1): 30 years: +40 %: 600 mins: Summer	74.75 0	73.70 0	73.744	0.044	3.8	0.049	0.000	3.8	34.914	OK
FEH (1): 30 years: +40 %: 600 mins: Winter	74.75 0	73.70 0	73.737	0.037	2.8	0.042	0.000	2.7	39.097	OK
FEH (1): 30 years: +40 %: 720 mins: Summer	74.75 0	73.70 0	73.740	0.040	3.3	0.046	0.000	3.3	36.156	OK
FEH (1): 30 years: +40 %: 720 mins: Winter	74.75 0	73.70 0	73.734	0.034	2.4	0.039	0.000	2.4	40.519	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH (1): 30 years: +40 %: 960 mins: Summer	74.75 0	73.70 0	73.736	0.036	2.6	0.041	0.000	2.6	38.202	OK
FEH (1): 30 years: +40 %: 960 mins: Winter	74.75 0	73.70 0	73.731	0.031	1.9	0.035	0.000	1.9	42.798	OK
FEH (1): 30 years: +40 %: 1440 mins: Summer	74.75 0	73.70 0	73.731	0.031	1.9	0.035	0.000	1.9	41.437	OK
FEH (1): 30 years: +40 %: 1440 mins: Winter	74.75 0	73.70 0	73.726	0.026	1.4	0.030	0.000	1.4	46.368	OK
FEH (1): 30 years: +40 %: 2160 mins: Summer	74.75 0	73.70 0	73.726	0.026	1.4	0.030	0.000	1.4	45.042	OK
FEH (1): 30 years: +40 %: 2160 mins: Winter	74.75 0	73.70 0	73.723	0.023	1.0	0.026	0.000	1.0	50.412	OK
FEH (1): 30 years: +40 %: 2880 mins: Summer	74.75 0	73.70 0	73.724	0.024	1.1	0.027	0.000	1.1	48.126	OK
FEH (1): 30 years: +40 %: 2880 mins: Winter	74.75 0	73.70 0	73.720	0.020	0.8	0.023	0.000	0.8	53.922	OK
FEH (1): 30 years: +40 %: 4320 mins: Summer	74.75 0	73.70 0	73.721	0.021	0.8	0.023	0.000	0.8	53.616	OK
FEH (1): 30 years: +40 %: 4320 mins: Winter	74.75 0	73.70 0	73.718	0.018	0.6	0.020	0.000	0.6	59.940	OK
FEH (1): 30 years: +40 %: 5760 mins: Summer	74.75 0	73.70 0	73.719	0.019	0.7	0.021	0.000	0.7	58.542	OK
FEH (1): 30 years: +40 %: 5760 mins: Winter	74.75 0	73.70 0	73.716	0.016	0.5	0.018	0.000	0.5	65.316	OK
FEH (1): 30 years: +40 %: 7200 mins: Summer	74.75 0	73.70 0	73.718	0.018	0.6	0.020	0.000	0.6	63.090	OK
FEH (1): 30 years: +40 %: 7200 mins: Winter	74.75 0	73.70 0	73.715	0.015	0.4	0.017	0.000	0.4	70.518	OK
FEH (1): 30 years: +40 %: 8640 mins: Summer	74.75 0	73.70 0	73.717	0.017	0.5	0.019	0.000	0.5	67.698	OK
FEH (1): 30 years: +40 %: 8640 mins: Winter	74.75 0	73.70 0	73.714	0.014	0.4	0.016	0.000	0.4	76.386	OK
FEH (1): 30 years: +40 %: 10080 mins: Summer	74.75 0	73.70 0	73.716	0.016	0.5	0.018	0.000	0.5	72.084	OK
FEH (1): 30 years: +40 %: 10080 mins: Winter	74.75 0	73.70 0	73.714	0.014	0.3	0.016	0.000	0.3	81.168	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (3): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH (1): 30 years: +40 %: 15 mins: Summer	74.00 0	73.40 0	73.512	0.112	23.7	0.127	0.000	22.4	11.939	OK
FEH (1): 30 years: +40 %: 15 mins: Winter	74.00 0	73.40 0	73.516	0.116	25.3	0.131	0.000	24.0	13.376	OK
FEH (1): 30 years: +40 %: 30 mins: Summer	74.00 0	73.40 0	73.500	0.100	18.4	0.113	0.000	18.4	15.892	OK
FEH (1): 30 years: +40 %: 30 mins: Winter	74.00 0	73.40 0	73.503	0.103	19.3	0.116	0.000	19.3	17.798	OK
FEH (1): 30 years: +40 %: 60 mins: Summer	74.00 0	73.40 0	73.493	0.093	16.2	0.106	0.000	16.2	20.206	OK
FEH (1): 30 years: +40 %: 60 mins: Winter	74.00 0	73.40 0	73.489	0.089	14.6	0.100	0.000	14.6	22.642	OK
FEH (1): 30 years: +40 %: 120 mins: Summer	74.00 0	73.40 0	73.479	0.079	11.6	0.089	0.000	11.6	24.490	OK
FEH (1): 30 years: +40 %: 120 mins: Winter	74.00 0	73.40 0	73.471	0.071	9.4	0.080	0.000	9.4	27.436	OK
FEH (1): 30 years: +40 %: 180 mins: Summer	74.00 0	73.40 0	73.470	0.070	9.1	0.079	0.000	9.1	27.057	OK
FEH (1): 30 years: +40 %: 180 mins: Winter	74.00 0	73.40 0	73.462	0.062	7.0	0.070	0.000	7.0	30.314	OK
FEH (1): 30 years: +40 %: 240 mins: Summer	74.00 0	73.40 0	73.464	0.064	7.5	0.072	0.000	7.5	28.913	OK
FEH (1): 30 years: +40 %: 240 mins: Winter	74.00 0	73.40 0	73.455	0.055	5.6	0.063	0.000	5.6	32.384	OK
FEH (1): 30 years: +40 %: 360 mins: Summer	74.00 0	73.40 0	73.455	0.055	5.6	0.062	0.000	5.6	31.571	OK
FEH (1): 30 years: +40 %: 360 mins: Winter	74.00 0	73.40 0	73.448	0.048	4.1	0.054	0.000	4.1	35.354	OK
FEH (1): 30 years: +40 %: 480 mins: Summer	74.00 0	73.40 0	73.450	0.050	4.5	0.057	0.000	4.5	33.429	OK
FEH (1): 30 years: +40 %: 480 mins: Winter	74.00 0	73.40 0	73.443	0.043	3.3	0.049	0.000	3.3	37.441	OK
FEH (1): 30 years: +40 %: 600 mins: Summer	74.00 0	73.40 0	73.446	0.046	3.8	0.052	0.000	3.8	34.911	OK
FEH (1): 30 years: +40 %: 600 mins: Winter	74.00 0	73.40 0	73.440	0.040	2.7	0.045	0.000	2.7	39.096	OK
FEH (1): 30 years: +40 %: 720 mins: Summer	74.00 0	73.40 0	73.443	0.043	3.3	0.049	0.000	3.3	36.153	OK
FEH (1): 30 years: +40 %: 720 mins: Winter	74.00 0	73.40 0	73.437	0.037	2.4	0.042	0.000	2.4	40.517	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026		
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		Company Address: GeoSon Limited		



FEH (1): 30 years: +40 %: 960 mins: Summer	74.00 0	73.40 0	73.438	0.038	2.6	0.044	0.000	2.6	38.199	OK
FEH (1): 30 years: +40 %: 960 mins: Winter	74.00 0	73.40 0	73.433	0.033	1.9	0.037	0.000	1.9	42.796	OK
FEH (1): 30 years: +40 %: 1440 mins: Summer	74.00 0	73.40 0	73.433	0.033	1.9	0.037	0.000	1.9	41.433	OK
FEH (1): 30 years: +40 %: 1440 mins: Winter	74.00 0	73.40 0	73.429	0.029	1.4	0.032	0.000	1.4	46.366	OK
FEH (1): 30 years: +40 %: 2160 mins: Summer	74.00 0	73.40 0	73.429	0.029	1.4	0.032	0.000	1.4	45.040	OK
FEH (1): 30 years: +40 %: 2160 mins: Winter	74.00 0	73.40 0	73.425	0.025	1.0	0.028	0.000	1.0	50.410	OK
FEH (1): 30 years: +40 %: 2880 mins: Summer	74.00 0	73.40 0	73.426	0.026	1.1	0.029	0.000	1.1	48.124	OK
FEH (1): 30 years: +40 %: 2880 mins: Winter	74.00 0	73.40 0	73.422	0.022	0.8	0.025	0.000	0.8	53.920	OK
FEH (1): 30 years: +40 %: 4320 mins: Summer	74.00 0	73.40 0	73.423	0.023	0.8	0.026	0.000	0.8	53.614	OK
FEH (1): 30 years: +40 %: 4320 mins: Winter	74.00 0	73.40 0	73.420	0.020	0.6	0.022	0.000	0.6	59.938	OK
FEH (1): 30 years: +40 %: 5760 mins: Summer	74.00 0	73.40 0	73.421	0.021	0.7	0.023	0.000	0.7	58.540	OK
FEH (1): 30 years: +40 %: 5760 mins: Winter	74.00 0	73.40 0	73.418	0.018	0.5	0.020	0.000	0.5	65.314	OK
FEH (1): 30 years: +40 %: 7200 mins: Summer	74.00 0	73.40 0	73.419	0.019	0.6	0.022	0.000	0.6	63.088	OK
FEH (1): 30 years: +40 %: 7200 mins: Winter	74.00 0	73.40 0	73.417	0.017	0.4	0.019	0.000	0.4	70.516	OK
FEH (1): 30 years: +40 %: 8640 mins: Summer	74.00 0	73.40 0	73.418	0.018	0.5	0.021	0.000	0.5	67.696	OK
FEH (1): 30 years: +40 %: 8640 mins: Winter	74.00 0	73.40 0	73.416	0.016	0.4	0.018	0.000	0.4	76.384	OK
FEH (1): 30 years: +40 %: 10080 mins: Summer	74.00 0	73.40 0	73.418	0.018	0.5	0.020	0.000	0.5	72.082	OK
FEH (1): 30 years: +40 %: 10080 mins: Winter	74.00 0	73.40 0	73.415	0.015	0.3	0.017	0.000	0.3	81.166	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Swale: Rank By: Max. Avg. Depth

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Velocity (m/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH (1): 30 years: +40 %: 15 mins: Summer	73.341	73.280	0.041	0.180	22.4	11.259	0.000	0.000	0.2	0.8	0.878		80.823	OK
FEH (1): 30 years: +40 %: 15 mins: Winter	73.344	73.292	0.044	0.192	24.0	12.659	0.000	0.000	0.2	0.8	0.923		78.439	OK
FEH (1): 30 years: +40 %: 30 mins: Summer	73.339	73.308	0.039	0.208	18.4	14.651	0.000	0.000	0.2	0.8	2.204		75.046	OK
FEH (1): 30 years: +40 %: 30 mins: Winter	73.340	73.321	0.040	0.221	19.3	16.494	0.000	0.000	0.2	0.9	2.298		71.907	OK
FEH (1): 30 years: +40 %: 60 mins: Summer	73.336	73.329	0.036	0.229	16.2	17.788	0.000	0.000	0.2	1.0	5.051		69.704	OK
FEH (1): 30 years: +40 %: 60 mins: Winter	73.344	73.344	0.044	0.244	14.6	20.151	0.000	0.000	0.2	0.9	5.235		65.679	OK
FEH (1): 30 years: +40 %: 120 mins: Summer	73.340	73.340	0.040	0.240	11.6	19.471	0.000	0.000	0.2	1.0	10.793		66.837	OK
FEH (1): 30 years: +40 %: 120 mins: Winter	73.358	73.358	0.058	0.258	9.4	22.356	0.000	0.000	0.2	1.0	11.163		61.923	OK
FEH (1): 30 years: +40 %: 180 mins: Summer	73.340	73.340	0.040	0.240	9.1	19.476	0.000	0.000	0.2	1.0	16.282		66.829	OK
FEH (1): 30 years: +40 %: 180 mins: Winter	73.360	73.360	0.060	0.260	7.0	22.653	0.000	0.000	0.2	1.0	16.909		61.416	OK
FEH (1): 30 years: +40 %: 240 mins: Summer	73.338	73.338	0.038	0.238	7.5	19.128	0.000	0.000	0.2	1.0	21.371		67.421	OK
FEH (1): 30 years: +40 %: 240 mins: Winter	73.358	73.357	0.058	0.257	5.6	22.235	0.000	0.000	0.1	1.0	22.321		62.130	OK
FEH (1): 30 years: +40 %: 360 mins: Summer	73.332	73.332	0.032	0.232	5.6	18.203	0.000	0.000	0.1	1.0	30.999		68.996	OK
FEH (1): 30 years: +40 %: 360 mins: Winter	73.350	73.350	0.050	0.250	4.1	21.042	0.000	0.000	0.1	1.0	32.589		64.160	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale						Date: 24/03/2026											
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase						Designed by: TS								Checked by:		Approved By:	
						Company Address: GeoSon Limited											

FEH (1): 30 years: +40 %: 480 mins: Summer	73.325	73.325	0.025	0.225	4.5	17.202	0.000	0.000	0.1	1.0	33.344		70.702	OK
FEH (1): 30 years: +40 %: 480 mins: Winter	73.341	73.341	0.041	0.241	3.3	19.654	0.000	0.000	0.1	1.0	37.311		66.525	OK
FEH (1): 30 years: +40 %: 600 mins: Summer	73.319	73.319	0.019	0.219	3.8	16.211	0.000	0.000	0.1	1.0	34.848		72.389	OK
FEH (1): 30 years: +40 %: 600 mins: Winter	73.332	73.332	0.032	0.232	2.7	18.246	0.000	0.000	0.1	1.0	39.032		68.923	OK
FEH (1): 30 years: +40 %: 720 mins: Summer	73.314	73.312	0.014	0.212	3.3	15.276	0.000	0.000	0.1	1.0	36.090		73.982	OK
FEH (1): 30 years: +40 %: 720 mins: Winter	73.323	73.323	0.023	0.223	2.4	16.862	0.000	0.000	0.1	1.0	40.454		71.281	OK
FEH (1): 30 years: +40 %: 960 mins: Summer	73.312	73.299	0.012	0.199	2.6	13.521	0.000	0.000	0.1	1.0	38.134		76.970	OK
FEH (1): 30 years: +40 %: 960 mins: Winter	73.310	73.305	0.010	0.205	1.9	14.260	0.000	0.000	0.1	1.0	42.731		75.712	OK
FEH (1): 30 years: +40 %: 1440 mins: Summer	73.310	73.274	0.010	0.174	1.9	10.540	0.000	0.000	0.1	1.0	41.367		82.047	OK
FEH (1): 30 years: +40 %: 1440 mins: Winter	73.308	73.265	0.008	0.165	1.4	9.556	0.000	0.000	0.1	1.0	46.299		83.723	OK
FEH (1): 30 years: +40 %: 2160 mins: Summer	73.308	73.230	0.008	0.130	1.4	6.356	0.000	0.000	0.1	1.0	44.972		89.174	OK
FEH (1): 30 years: +40 %: 2160 mins: Winter	73.307	73.182	0.007	0.082	1.0	3.193	0.000	0.000	0.1	0.9	50.341		94.562	OK
FEH (1): 30 years: +40 %: 2880 mins: Summer	73.307	73.186	0.007	0.086	1.1	3.416	0.000	0.000	0.1	1.0	48.055		94.182	OK
FEH (1): 30 years: +40 %: 2880 mins: Winter	73.306	73.164	0.006	0.064	0.8	2.253	0.000	0.000	0.1	0.8	53.851		96.162	OK
FEH (1): 30 years: +40 %: 4320 mins: Summer	73.306	73.164	0.006	0.064	0.8	2.263	0.000	0.000	0.1	0.8	53.545		96.145	OK
FEH (1): 30 years: +40 %: 4320 mins: Winter	73.305	73.147	0.005	0.047	0.6	1.554	0.000	0.000	0.1	0.6	59.869		97.353	OK
FEH (1): 30 years: +40 %: 5760 mins: Summer	73.305	73.154	0.005	0.054	0.7	1.746	0.000	0.000	0.1	0.7	58.471		97.026	OK

Project: Beckley Stud (our ref: 73541) 1 in 30yr + 40% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH (1): 30 years: +40 %: 5760 mins: Winter	73.304	73.140	0.004	0.040	0.5	1.315	0.000	0.000	0.1	0.5	65.245		97.761	OK
FEH (1): 30 years: +40 %: 7200 mins: Summer	73.305	73.146	0.005	0.046	0.6	1.509	0.000	0.000	0.1	0.6	63.019		97.430	OK
FEH (1): 30 years: +40 %: 7200 mins: Winter	73.304	73.136	0.004	0.036	0.4	1.196	0.000	0.000	0.1	0.4	70.447		97.962	OK
FEH (1): 30 years: +40 %: 8640 mins: Summer	73.305	73.141	0.005	0.041	0.5	1.374	0.000	0.000	0.1	0.5	67.627		97.660	OK
FEH (1): 30 years: +40 %: 8640 mins: Winter	73.304	73.133	0.004	0.034	0.4	1.109	0.000	0.000	0.0	0.4	76.315		98.111	OK
FEH (1): 30 years: +40 %: 10080 mins: Summer	73.304	73.139	0.004	0.039	0.5	1.295	0.000	0.000	0.1	0.5	72.013		97.794	OK
FEH (1): 30 years: +40 %: 10080 mins: Winter	73.304	73.132	0.004	0.032	0.3	1.051	0.000	0.000	0.0	0.3	81.097		98.209	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026			
Report Details: Type: Inflows Storm Phase: Phase	Designed by: TS	Checked by:	Approved By:	
Company Address: GeoSon Limited				



Catchment Area

Type : Catchment Area

Area (ha)	0.055
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
		Designed by: TS	Checked by:		Approved By:
Report Details: Type: Junctions Storm Phase: Phase		Company Address: GeoSon Limited			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Manhole	Manhole	208550.307	601569.199	75.470	1.000	74.470	Circular	1.200
Manhole (1)	Manhole	208577.073	601566.005	75.380	1.180	74.200	Circular	1.200
Manhole (2)	Manhole	208602.977	601562.320	74.750	1.050	73.700	Circular	1.200
Manhole (3)	Manhole	208640.129	601557.853	74.000	0.600	73.400	Circular	1.200

Name	Lock
Manhole	None
Manhole (1)	None
Manhole (2)	None
Manhole (3)	None

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026		
	Designed by: TS	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: GeoSon Limited		



Swale

Type : Swale

Swale

Exceedance Level (m)	73.600
Depth (m)	0.500
Base Level (m)	73.100
Top Width (m)	5.000
Side Slope (1:X)	3.00
Base Width (m)	2.000
Freeboard (mm)	150
Length (m)	55.000
Long. Slope (1:X)	275.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	58.712

Inlets

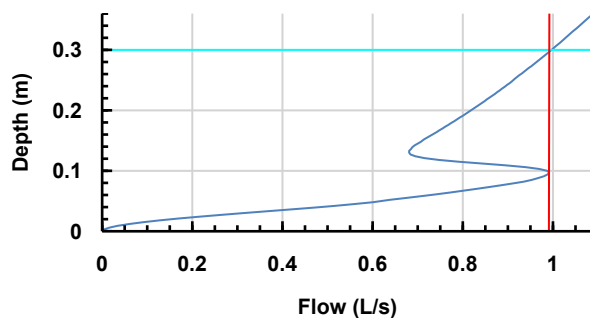
Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (3)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®
Invert Level (m)	73.100
Design Depth (m)	0.300
Design Flow (L/s)	1.0
Objective	Minimise Blockage Risk
Application	Surface Water Only
Sump Available	☐
Unit Reference	CCL-0050-1000-0300-1000



Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026			
Report Details: Type: Stormwater Controls Storm Phase: Phase	Designed by: TS		Checked by:	Approved By:
Company Address: GeoSon Limited				

Advanced	
Swale	
Porosity (%)	100

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
		Designed by: TS	Checked by:		Approved By:
Report Details: Type: Connections Storm Phase: Phase		Company Address: GeoSon Limited			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
Pipe	26.956	Pipe	99.837		0.6	225	75.470	74.470
Pipe (1)	26.164	Pipe	52.328		0.6	225	75.380	74.200
Pipe (2)	37.420	Pipe	124.733		0.6	225	74.750	73.700
Pipe (3)	10.683	Pipe	106.833		0.6	225	74.000	73.400

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock
Pipe	75.380	74.200		None
Pipe (1)	74.750	73.700		None
Pipe (2)	74.000	73.400		None
Pipe (3)	73.800	73.300		None

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026			
Report Title: Rainfall Analysis Criteria	Designed by: TS		Checked by:	Approved By:
Company Address: GeoSon Limited				

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall		
FEH		Type: FEH
Site Location	GB 515000 127350 TQ 15000 27350	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026		
	Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: GeoSon Limited		





Summary Results for Manhole: Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	75.47 0	74.47 0	74.616	0.146	36.0	0.165	0.000	35.0	15.703	OK
FEH: 100 years: +45 %: 15 mins: Winter	75.47 0	74.47 0	74.621	0.151	37.9	0.171	0.000	36.9	17.588	OK
FEH: 100 years: +45 %: 30 mins: Summer	75.47 0	74.47 0	74.584	0.114	24.2	0.129	0.000	24.2	20.980	OK
FEH: 100 years: +45 %: 30 mins: Winter	75.47 0	74.47 0	74.588	0.118	25.5	0.133	0.000	25.5	23.501	OK
FEH: 100 years: +45 %: 60 mins: Summer	75.47 0	74.47 0	74.576	0.106	21.5	0.120	0.000	21.5	26.852	OK
FEH: 100 years: +45 %: 60 mins: Winter	75.47 0	74.47 0	74.570	0.100	19.4	0.113	0.000	19.4	30.078	OK
FEH: 100 years: +45 %: 120 mins: Summer	75.47 0	74.47 0	74.557	0.087	15.1	0.099	0.000	15.1	31.887	OK
FEH: 100 years: +45 %: 120 mins: Winter	75.47 0	74.47 0	74.548	0.078	12.2	0.088	0.000	12.2	35.710	OK
FEH: 100 years: +45 %: 180 mins: Summer	75.47 0	74.47 0	74.546	0.076	11.7	0.086	0.000	11.7	35.036	OK
FEH: 100 years: +45 %: 180 mins: Winter	75.47 0	74.47 0	74.536	0.066	9.1	0.075	0.000	9.1	39.254	OK
FEH: 100 years: +45 %: 240 mins: Summer	75.47 0	74.47 0	74.539	0.069	9.7	0.078	0.000	9.7	37.388	OK
FEH: 100 years: +45 %: 240 mins: Winter	75.47 0	74.47 0	74.529	0.059	7.3	0.067	0.000	7.3	41.882	OK
FEH: 100 years: +45 %: 360 mins: Summer	75.47 0	74.47 0	74.529	0.059	7.2	0.067	0.000	7.2	40.742	OK
FEH: 100 years: +45 %: 360 mins: Winter	75.47 0	74.47 0	74.520	0.050	5.3	0.057	0.000	5.3	45.631	OK
FEH: 100 years: +45 %: 480 mins: Summer	75.47 0	74.47 0	74.523	0.053	5.9	0.060	0.000	5.9	43.280	OK
FEH: 100 years: +45 %: 480 mins: Winter	75.47 0	74.47 0	74.515	0.045	4.3	0.051	0.000	4.3	48.475	OK
FEH: 100 years: +45 %: 600 mins: Summer	75.47 0	74.47 0	74.519	0.049	4.9	0.055	0.000	4.9	45.355	OK
FEH: 100 years: +45 %: 600 mins: Winter	75.47 0	74.47 0	74.511	0.041	3.6	0.047	0.000	3.6	50.784	OK
FEH: 100 years: +45 %: 720 mins: Summer	75.47 0	74.47 0	74.515	0.045	4.3	0.051	0.000	4.3	47.035	OK
FEH: 100 years: +45 %: 720 mins: Winter	75.47 0	74.47 0	74.508	0.038	3.1	0.044	0.000	3.1	52.728	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH: 100 years: +45 %: 960 mins: Summer	75.47 0	74.47 0	74.510	0.040	3.4	0.046	0.000	3.4	49.933	OK
FEH: 100 years: +45 %: 960 mins: Winter	75.47 0	74.47 0	74.504	0.034	2.5	0.039	0.000	2.5	55.908	OK
FEH: 100 years: +45 %: 1440 mins: Summer	75.47 0	74.47 0	74.504	0.034	2.5	0.039	0.000	2.5	54.307	OK
FEH: 100 years: +45 %: 1440 mins: Winter	75.47 0	74.47 0	74.499	0.029	1.8	0.033	0.000	1.8	60.781	OK
FEH: 100 years: +45 %: 2160 mins: Summer	75.47 0	74.47 0	74.499	0.029	1.8	0.033	0.000	1.8	58.933	OK
FEH: 100 years: +45 %: 2160 mins: Winter	75.47 0	74.47 0	74.495	0.025	1.3	0.029	0.000	1.3	66.168	OK
FEH: 100 years: +45 %: 2880 mins: Summer	75.47 0	74.47 0	74.496	0.026	1.4	0.030	0.000	1.4	62.635	OK
FEH: 100 years: +45 %: 2880 mins: Winter	75.47 0	74.47 0	74.493	0.023	1.0	0.026	0.000	1.0	70.086	OK
FEH: 100 years: +45 %: 4320 mins: Summer	75.47 0	74.47 0	74.493	0.023	1.0	0.026	0.000	1.0	68.868	OK
FEH: 100 years: +45 %: 4320 mins: Winter	75.47 0	74.47 0	74.490	0.020	0.8	0.022	0.000	0.8	77.040	OK
FEH: 100 years: +45 %: 5760 mins: Summer	75.47 0	74.47 0	74.491	0.021	0.8	0.023	0.000	0.8	74.442	OK
FEH: 100 years: +45 %: 5760 mins: Winter	75.47 0	74.47 0	74.488	0.018	0.6	0.020	0.000	0.6	83.574	OK
FEH: 100 years: +45 %: 7200 mins: Summer	75.47 0	74.47 0	74.489	0.019	0.7	0.022	0.000	0.7	79.308	OK
FEH: 100 years: +45 %: 7200 mins: Winter	75.47 0	74.47 0	74.486	0.016	0.5	0.019	0.000	0.5	89.076	OK
FEH: 100 years: +45 %: 8640 mins: Summer	75.47 0	74.47 0	74.488	0.018	0.6	0.021	0.000	0.6	84.492	OK
FEH: 100 years: +45 %: 8640 mins: Winter	75.47 0	74.47 0	74.486	0.016	0.5	0.018	0.000	0.5	94.548	OK
FEH: 100 years: +45 %: 10080 mins: Summer	75.47 0	74.47 0	74.487	0.017	0.6	0.020	0.000	0.6	89.040	OK
FEH: 100 years: +45 %: 10080 mins: Winter	75.47 0	74.47 0	74.485	0.015	0.4	0.017	0.000	0.4	99.210	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (1): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	75.38 0	74.20 0	74.312	0.112	35.0	0.126	0.000	33.6	15.684	OK
FEH: 100 years: +45 %: 15 mins: Winter	75.38 0	74.20 0	74.316	0.116	36.9	0.131	0.000	35.5	17.568	OK
FEH: 100 years: +45 %: 30 mins: Summer	75.38 0	74.20 0	74.290	0.090	24.2	0.102	0.000	24.2	20.967	OK
FEH: 100 years: +45 %: 30 mins: Winter	75.38 0	74.20 0	74.293	0.093	25.5	0.105	0.000	25.5	23.489	OK
FEH: 100 years: +45 %: 60 mins: Summer	75.38 0	74.20 0	74.284	0.084	21.5	0.095	0.000	21.5	26.845	OK
FEH: 100 years: +45 %: 60 mins: Winter	75.38 0	74.20 0	74.280	0.080	19.4	0.090	0.000	19.4	30.073	OK
FEH: 100 years: +45 %: 120 mins: Summer	75.38 0	74.20 0	74.270	0.070	15.1	0.079	0.000	15.1	31.885	OK
FEH: 100 years: +45 %: 120 mins: Winter	75.38 0	74.20 0	74.263	0.063	12.2	0.071	0.000	12.2	35.708	OK
FEH: 100 years: +45 %: 180 mins: Summer	75.38 0	74.20 0	74.261	0.061	11.7	0.069	0.000	11.7	35.035	OK
FEH: 100 years: +45 %: 180 mins: Winter	75.38 0	74.20 0	74.254	0.054	9.1	0.061	0.000	9.1	39.253	OK
FEH: 100 years: +45 %: 240 mins: Summer	75.38 0	74.20 0	74.256	0.056	9.7	0.063	0.000	9.7	37.387	OK
FEH: 100 years: +45 %: 240 mins: Winter	75.38 0	74.20 0	74.248	0.048	7.3	0.055	0.000	7.3	41.881	OK
FEH: 100 years: +45 %: 360 mins: Summer	75.38 0	74.20 0	74.248	0.048	7.2	0.054	0.000	7.2	40.742	OK
FEH: 100 years: +45 %: 360 mins: Winter	75.38 0	74.20 0	74.241	0.041	5.3	0.047	0.000	5.3	45.631	OK
FEH: 100 years: +45 %: 480 mins: Summer	75.38 0	74.20 0	74.243	0.043	5.9	0.049	0.000	5.9	43.279	OK
FEH: 100 years: +45 %: 480 mins: Winter	75.38 0	74.20 0	74.237	0.037	4.3	0.042	0.000	4.3	48.474	OK
FEH: 100 years: +45 %: 600 mins: Summer	75.38 0	74.20 0	74.240	0.040	4.9	0.045	0.000	4.9	45.355	OK
FEH: 100 years: +45 %: 600 mins: Winter	75.38 0	74.20 0	74.234	0.034	3.6	0.038	0.000	3.6	50.784	OK
FEH: 100 years: +45 %: 720 mins: Summer	75.38 0	74.20 0	74.237	0.037	4.3	0.042	0.000	4.3	47.035	OK
FEH: 100 years: +45 %: 720 mins: Winter	75.38 0	74.20 0	74.232	0.032	3.1	0.036	0.000	3.1	52.728	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH: 100 years: +45 %: 960 mins: Summer	75.38 0	74.20 0	74.233	0.033	3.4	0.038	0.000	3.4	49.933	OK
FEH: 100 years: +45 %: 960 mins: Winter	75.38 0	74.20 0	74.228	0.028	2.5	0.032	0.000	2.5	55.908	OK
FEH: 100 years: +45 %: 1440 mins: Summer	75.38 0	74.20 0	74.228	0.028	2.5	0.032	0.000	2.5	54.307	OK
FEH: 100 years: +45 %: 1440 mins: Winter	75.38 0	74.20 0	74.224	0.024	1.8	0.028	0.000	1.8	60.780	OK
FEH: 100 years: +45 %: 2160 mins: Summer	75.38 0	74.20 0	74.224	0.024	1.8	0.028	0.000	1.8	58.932	OK
FEH: 100 years: +45 %: 2160 mins: Winter	75.38 0	74.20 0	74.221	0.021	1.3	0.024	0.000	1.3	66.168	OK
FEH: 100 years: +45 %: 2880 mins: Summer	75.38 0	74.20 0	74.222	0.022	1.4	0.025	0.000	1.4	62.634	OK
FEH: 100 years: +45 %: 2880 mins: Winter	75.38 0	74.20 0	74.219	0.019	1.0	0.021	0.000	1.0	70.086	OK
FEH: 100 years: +45 %: 4320 mins: Summer	75.38 0	74.20 0	74.219	0.019	1.0	0.021	0.000	1.0	68.868	OK
FEH: 100 years: +45 %: 4320 mins: Winter	75.38 0	74.20 0	74.216	0.016	0.8	0.018	0.000	0.8	77.040	OK
FEH: 100 years: +45 %: 5760 mins: Summer	75.38 0	74.20 0	74.217	0.017	0.8	0.019	0.000	0.8	74.442	OK
FEH: 100 years: +45 %: 5760 mins: Winter	75.38 0	74.20 0	74.215	0.015	0.6	0.017	0.000	0.6	83.574	OK
FEH: 100 years: +45 %: 7200 mins: Summer	75.38 0	74.20 0	74.216	0.016	0.7	0.018	0.000	0.7	79.308	OK
FEH: 100 years: +45 %: 7200 mins: Winter	75.38 0	74.20 0	74.214	0.014	0.5	0.016	0.000	0.5	89.076	OK
FEH: 100 years: +45 %: 8640 mins: Summer	75.38 0	74.20 0	74.215	0.015	0.6	0.017	0.000	0.6	84.492	OK
FEH: 100 years: +45 %: 8640 mins: Winter	75.38 0	74.20 0	74.213	0.013	0.5	0.015	0.000	0.5	94.548	OK
FEH: 100 years: +45 %: 10080 mins: Summer	75.38 0	74.20 0	74.214	0.014	0.6	0.016	0.000	0.6	89.040	OK
FEH: 100 years: +45 %: 10080 mins: Winter	75.38 0	74.20 0	74.212	0.012	0.4	0.014	0.000	0.4	99.209	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (2): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	74.75 0	73.70 0	73.844	0.144	33.6	0.163	0.000	31.2	15.657	OK
FEH: 100 years: +45 %: 15 mins: Winter	74.75 0	73.70 0	73.850	0.150	35.5	0.170	0.000	33.1	17.537	OK
FEH: 100 years: +45 %: 30 mins: Summer	74.75 0	73.70 0	73.820	0.120	24.2	0.136	0.000	24.2	20.955	OK
FEH: 100 years: +45 %: 30 mins: Winter	74.75 0	73.70 0	73.824	0.124	25.5	0.140	0.000	25.5	23.477	OK
FEH: 100 years: +45 %: 60 mins: Summer	74.75 0	73.70 0	73.811	0.111	21.5	0.126	0.000	21.5	26.840	OK
FEH: 100 years: +45 %: 60 mins: Winter	74.75 0	73.70 0	73.805	0.105	19.4	0.118	0.000	19.4	30.066	OK
FEH: 100 years: +45 %: 120 mins: Summer	74.75 0	73.70 0	73.791	0.091	15.1	0.102	0.000	15.1	31.882	OK
FEH: 100 years: +45 %: 120 mins: Winter	74.75 0	73.70 0	73.780	0.080	12.2	0.091	0.000	12.2	35.705	OK
FEH: 100 years: +45 %: 180 mins: Summer	74.75 0	73.70 0	73.779	0.079	11.7	0.089	0.000	11.7	35.033	OK
FEH: 100 years: +45 %: 180 mins: Winter	74.75 0	73.70 0	73.768	0.068	9.1	0.077	0.000	9.1	39.251	OK
FEH: 100 years: +45 %: 240 mins: Summer	74.75 0	73.70 0	73.771	0.071	9.7	0.080	0.000	9.7	37.385	OK
FEH: 100 years: +45 %: 240 mins: Winter	74.75 0	73.70 0	73.761	0.061	7.3	0.069	0.000	7.3	41.880	OK
FEH: 100 years: +45 %: 360 mins: Summer	74.75 0	73.70 0	73.761	0.061	7.2	0.068	0.000	7.2	40.741	OK
FEH: 100 years: +45 %: 360 mins: Winter	74.75 0	73.70 0	73.752	0.052	5.3	0.058	0.000	5.3	45.630	OK
FEH: 100 years: +45 %: 480 mins: Summer	74.75 0	73.70 0	73.754	0.054	5.9	0.061	0.000	5.9	43.278	OK
FEH: 100 years: +45 %: 480 mins: Winter	74.75 0	73.70 0	73.746	0.046	4.3	0.052	0.000	4.2	48.474	OK
FEH: 100 years: +45 %: 600 mins: Summer	74.75 0	73.70 0	73.750	0.050	4.9	0.056	0.000	4.9	45.354	OK
FEH: 100 years: +45 %: 600 mins: Winter	74.75 0	73.70 0	73.742	0.042	3.6	0.048	0.000	3.6	50.783	OK
FEH: 100 years: +45 %: 720 mins: Summer	74.75 0	73.70 0	73.746	0.046	4.3	0.052	0.000	4.3	47.035	OK
FEH: 100 years: +45 %: 720 mins: Winter	74.75 0	73.70 0	73.739	0.039	3.1	0.044	0.000	3.1	52.727	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH: 100 years: +45 %: 960 mins: Summer	74.75 0	73.70 0	73.741	0.041	3.4	0.047	0.000	3.4	49.933	OK
FEH: 100 years: +45 %: 960 mins: Winter	74.75 0	73.70 0	73.735	0.035	2.5	0.040	0.000	2.5	55.907	OK
FEH: 100 years: +45 %: 1440 mins: Summer	74.75 0	73.70 0	73.735	0.035	2.5	0.040	0.000	2.5	54.307	OK
FEH: 100 years: +45 %: 1440 mins: Winter	74.75 0	73.70 0	73.730	0.030	1.8	0.034	0.000	1.8	60.780	OK
FEH: 100 years: +45 %: 2160 mins: Summer	74.75 0	73.70 0	73.730	0.030	1.8	0.034	0.000	1.8	58.933	OK
FEH: 100 years: +45 %: 2160 mins: Winter	74.75 0	73.70 0	73.726	0.026	1.3	0.029	0.000	1.3	66.168	OK
FEH: 100 years: +45 %: 2880 mins: Summer	74.75 0	73.70 0	73.727	0.027	1.4	0.031	0.000	1.4	62.635	OK
FEH: 100 years: +45 %: 2880 mins: Winter	74.75 0	73.70 0	73.723	0.023	1.0	0.026	0.000	1.0	70.086	OK
FEH: 100 years: +45 %: 4320 mins: Summer	74.75 0	73.70 0	73.723	0.023	1.0	0.026	0.000	1.0	68.868	OK
FEH: 100 years: +45 %: 4320 mins: Winter	74.75 0	73.70 0	73.720	0.020	0.8	0.023	0.000	0.8	77.040	OK
FEH: 100 years: +45 %: 5760 mins: Summer	74.75 0	73.70 0	73.721	0.021	0.8	0.024	0.000	0.8	74.442	OK
FEH: 100 years: +45 %: 5760 mins: Winter	74.75 0	73.70 0	73.718	0.018	0.6	0.021	0.000	0.6	83.574	OK
FEH: 100 years: +45 %: 7200 mins: Summer	74.75 0	73.70 0	73.720	0.020	0.7	0.022	0.000	0.7	79.308	OK
FEH: 100 years: +45 %: 7200 mins: Winter	74.75 0	73.70 0	73.717	0.017	0.5	0.019	0.000	0.5	89.076	OK
FEH: 100 years: +45 %: 8640 mins: Summer	74.75 0	73.70 0	73.719	0.019	0.6	0.021	0.000	0.6	84.492	OK
FEH: 100 years: +45 %: 8640 mins: Winter	74.75 0	73.70 0	73.716	0.016	0.5	0.018	0.000	0.5	94.548	OK
FEH: 100 years: +45 %: 10080 mins: Summer	74.75 0	73.70 0	73.718	0.018	0.6	0.020	0.000	0.6	89.040	OK
FEH: 100 years: +45 %: 10080 mins: Winter	74.75 0	73.70 0	73.715	0.015	0.4	0.017	0.000	0.4	99.210	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Manhole (3): Rank By: Max. Depth

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	74.00 0	73.40 0	73.531	0.131	31.2	0.148	0.000	29.6	15.613	OK
FEH: 100 years: +45 %: 15 mins: Winter	74.00 0	73.40 0	73.536	0.136	33.1	0.153	0.000	31.6	17.493	OK
FEH: 100 years: +45 %: 30 mins: Summer	74.00 0	73.40 0	73.516	0.116	24.2	0.131	0.000	24.2	20.935	OK
FEH: 100 years: +45 %: 30 mins: Winter	74.00 0	73.40 0	73.519	0.119	25.5	0.135	0.000	25.5	23.458	OK
FEH: 100 years: +45 %: 60 mins: Summer	74.00 0	73.40 0	73.509	0.109	21.5	0.123	0.000	21.5	26.831	OK
FEH: 100 years: +45 %: 60 mins: Winter	74.00 0	73.40 0	73.503	0.103	19.4	0.116	0.000	19.4	30.061	OK
FEH: 100 years: +45 %: 120 mins: Summer	74.00 0	73.40 0	73.490	0.090	15.1	0.102	0.000	15.1	31.882	OK
FEH: 100 years: +45 %: 120 mins: Winter	74.00 0	73.40 0	73.481	0.081	12.2	0.091	0.000	12.2	35.709	OK
FEH: 100 years: +45 %: 180 mins: Summer	74.00 0	73.40 0	73.479	0.079	11.7	0.090	0.000	11.7	35.036	OK
FEH: 100 years: +45 %: 180 mins: Winter	74.00 0	73.40 0	73.470	0.070	9.1	0.079	0.000	9.1	39.257	OK
FEH: 100 years: +45 %: 240 mins: Summer	74.00 0	73.40 0	73.472	0.072	9.7	0.082	0.000	9.7	37.389	OK
FEH: 100 years: +45 %: 240 mins: Winter	74.00 0	73.40 0	73.463	0.063	7.3	0.071	0.000	7.3	41.887	OK
FEH: 100 years: +45 %: 360 mins: Summer	74.00 0	73.40 0	73.462	0.062	7.2	0.071	0.000	7.2	40.745	OK
FEH: 100 years: +45 %: 360 mins: Winter	74.00 0	73.40 0	73.454	0.054	5.3	0.061	0.000	5.3	45.638	OK
FEH: 100 years: +45 %: 480 mins: Summer	74.00 0	73.40 0	73.457	0.057	5.9	0.064	0.000	5.9	43.282	OK
FEH: 100 years: +45 %: 480 mins: Winter	74.00 0	73.40 0	73.448	0.048	4.2	0.055	0.000	4.3	48.481	OK
FEH: 100 years: +45 %: 600 mins: Summer	74.00 0	73.40 0	73.452	0.052	4.9	0.059	0.000	4.9	45.357	OK
FEH: 100 years: +45 %: 600 mins: Winter	74.00 0	73.40 0	73.445	0.045	3.6	0.051	0.000	3.6	50.790	OK
FEH: 100 years: +45 %: 720 mins: Summer	74.00 0	73.40 0	73.449	0.049	4.3	0.055	0.000	4.3	47.035	OK
FEH: 100 years: +45 %: 720 mins: Winter	74.00 0	73.40 0	73.442	0.042	3.1	0.047	0.000	3.1	52.732	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026		
		Designed by: TS	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address: GeoSon Limited		



FEH: 100 years: +45 %: 960 mins: Summer	74.00 0	73.40 0	73.444	0.044	3.4	0.049	0.000	3.4	49.931	OK
FEH: 100 years: +45 %: 960 mins: Winter	74.00 0	73.40 0	73.437	0.037	2.5	0.042	0.000	2.5	55.909	OK
FEH: 100 years: +45 %: 1440 mins: Summer	74.00 0	73.40 0	73.438	0.038	2.5	0.042	0.000	2.5	54.305	OK
FEH: 100 years: +45 %: 1440 mins: Winter	74.00 0	73.40 0	73.432	0.032	1.8	0.037	0.000	1.8	60.779	OK
FEH: 100 years: +45 %: 2160 mins: Summer	74.00 0	73.40 0	73.432	0.032	1.8	0.037	0.000	1.8	58.930	OK
FEH: 100 years: +45 %: 2160 mins: Winter	74.00 0	73.40 0	73.428	0.028	1.3	0.032	0.000	1.3	66.166	OK
FEH: 100 years: +45 %: 2880 mins: Summer	74.00 0	73.40 0	73.429	0.029	1.4	0.033	0.000	1.4	62.632	OK
FEH: 100 years: +45 %: 2880 mins: Winter	74.00 0	73.40 0	73.425	0.025	1.0	0.028	0.000	1.0	70.084	OK
FEH: 100 years: +45 %: 4320 mins: Summer	74.00 0	73.40 0	73.425	0.025	1.0	0.029	0.000	1.0	68.866	OK
FEH: 100 years: +45 %: 4320 mins: Winter	74.00 0	73.40 0	73.422	0.022	0.8	0.025	0.000	0.8	77.038	OK
FEH: 100 years: +45 %: 5760 mins: Summer	74.00 0	73.40 0	73.423	0.023	0.8	0.026	0.000	0.8	74.440	OK
FEH: 100 years: +45 %: 5760 mins: Winter	74.00 0	73.40 0	73.420	0.020	0.6	0.022	0.000	0.6	83.572	OK
FEH: 100 years: +45 %: 7200 mins: Summer	74.00 0	73.40 0	73.421	0.021	0.7	0.024	0.000	0.7	79.306	OK
FEH: 100 years: +45 %: 7200 mins: Winter	74.00 0	73.40 0	73.418	0.018	0.5	0.021	0.000	0.5	89.074	OK
FEH: 100 years: +45 %: 8640 mins: Summer	74.00 0	73.40 0	73.420	0.020	0.6	0.023	0.000	0.6	84.490	OK
FEH: 100 years: +45 %: 8640 mins: Winter	74.00 0	73.40 0	73.417	0.017	0.5	0.020	0.000	0.5	94.546	OK
FEH: 100 years: +45 %: 10080 mins: Summer	74.00 0	73.40 0	73.419	0.019	0.6	0.022	0.000	0.6	89.038	OK
FEH: 100 years: +45 %: 10080 mins: Winter	74.00 0	73.40 0	73.417	0.017	0.4	0.019	0.000	0.4	99.208	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: TS	Checked by:		Approved By:
		Company Address: GeoSon Limited			



Summary Results for Swale: Rank By: Max. Avg. Depth

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Velocity (m/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	73.350	73.310	0.050	0.210	29.6	14.863	0.000	0.000	0.3	0.8	0.968		74.685	OK
FEH: 100 years: +45 %: 15 mins: Winter	73.352	73.322	0.052	0.222	31.6	16.708	0.000	0.000	0.3	0.9	1.013		71.543	OK
FEH: 100 years: +45 %: 30 mins: Summer	73.346	73.341	0.046	0.241	24.2	19.566	0.000	0.000	0.2	0.9	2.407		66.675	OK
FEH: 100 years: +45 %: 30 mins: Winter	73.356	73.356	0.056	0.256	25.5	22.020	0.000	0.000	0.3	0.9	2.505		62.495	OK
FEH: 100 years: +45 %: 60 mins: Summer	73.369	73.369	0.069	0.269	21.5	24.143	0.000	0.000	0.2	0.9	5.542		58.880	OK
FEH: 100 years: +45 %: 60 mins: Winter	73.388	73.388	0.088	0.288	19.4	27.316	0.000	0.000	0.2	1.0	5.721		53.474	OK
FEH: 100 years: +45 %: 120 mins: Summer	73.382	73.382	0.082	0.282	15.1	26.374	0.000	0.000	0.2	1.0	11.797		55.079	OK
FEH: 100 years: +45 %: 120 mins: Winter	73.404	73.404	0.104	0.304	12.2	30.132	0.000	0.000	0.2	1.0	12.176	20	48.678	OK
FEH: 100 years: +45 %: 180 mins: Summer	73.384	73.384	0.084	0.284	11.7	26.673	0.000	0.000	0.2	1.0	17.886		54.570	OK
FEH: 100 years: +45 %: 180 mins: Winter	73.408	73.408	0.108	0.308	9.1	30.885	0.000	0.000	0.2	1.0	18.506	25	47.396	OK
FEH: 100 years: +45 %: 240 mins: Summer	73.382	73.382	0.082	0.282	9.7	26.325	0.000	0.000	0.2	1.0	23.697		55.162	OK
FEH: 100 years: +45 %: 240 mins: Winter	73.407	73.407	0.107	0.307	7.3	30.732	0.000	0.000	0.1	1.0	24.602	30	47.657	OK
FEH: 100 years: +45 %: 360 mins: Summer	73.376	73.376	0.076	0.276	7.2	25.265	0.000	0.000	0.1	1.0	34.088		56.969	OK
FEH: 100 years: +45 %: 360 mins: Winter	73.400	73.400	0.100	0.300	5.3	29.386	0.000	0.000	0.1	1.0	35.770	10	49.949	OK

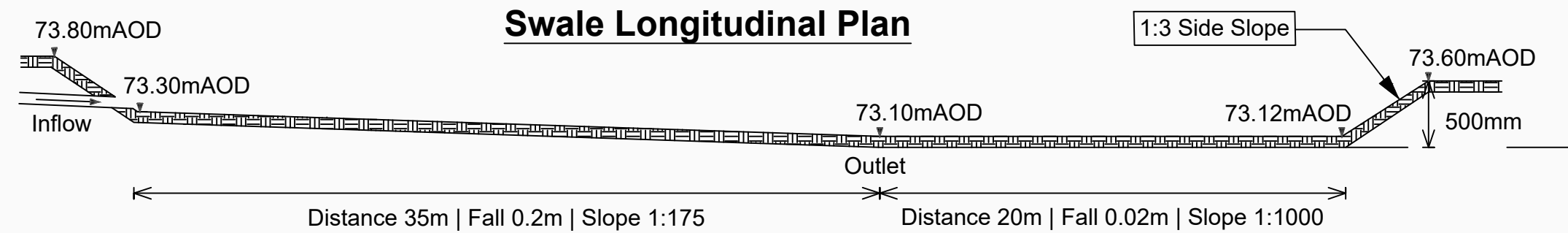
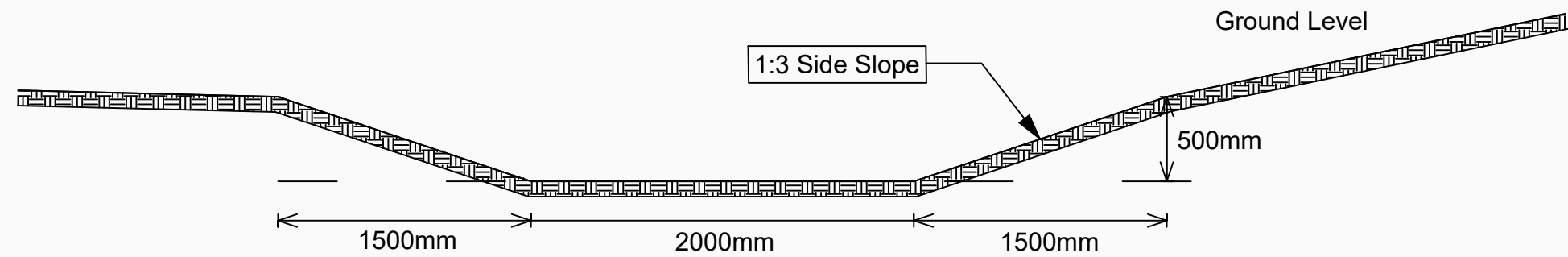
Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale	Date: 24/03/2026				
	Designed by:	Checked by:	Approved By:		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: GeoSon Limited			

FEH: 100 years: +45 %: 480 mins: Summer	73.370	73.370	0.070	0.270	5.9	24.240	0.000	0.000	0.1	1.0	42.943	58.715	OK
FEH: 100 years: +45 %: 480 mins: Winter	73.392	73.392	0.092	0.292	4.3	28.082	0.000	0.000	0.1	1.0	46.165	52.171	OK
FEH: 100 years: +45 %: 600 mins: Summer	73.364	73.364	0.064	0.264	4.9	23.249	0.000	0.000	0.1	1.0	45.288	60.402	OK
FEH: 100 years: +45 %: 600 mins: Winter	73.384	73.384	0.084	0.284	3.6	26.700	0.000	0.000	0.1	1.0	50.674	54.525	OK
FEH: 100 years: +45 %: 720 mins: Summer	73.358	73.358	0.058	0.258	4.3	22.285	0.000	0.000	0.1	1.0	46.981	62.043	OK
FEH: 100 years: +45 %: 720 mins: Winter	73.376	73.376	0.076	0.276	3.1	25.325	0.000	0.000	0.1	1.0	52.677	56.867	OK
FEH: 100 years: +45 %: 960 mins: Summer	73.346	73.346	0.047	0.246	3.4	20.482	0.000	0.000	0.1	1.0	49.874	65.115	OK
FEH: 100 years: +45 %: 960 mins: Winter	73.360	73.360	0.060	0.260	2.5	22.611	0.000	0.000	0.1	1.0	55.854	61.489	OK
FEH: 100 years: +45 %: 1440 mins: Summer	73.325	73.325	0.025	0.225	2.5	17.198	0.000	0.000	0.1	1.0	54.241	70.708	OK
FEH: 100 years: +45 %: 1440 mins: Winter	73.328	73.328	0.028	0.228	1.8	17.668	0.000	0.000	0.1	1.0	60.716	69.908	OK
FEH: 100 years: +45 %: 2160 mins: Summer	73.310	73.294	0.010	0.194	1.8	12.913	0.000	0.000	0.1	1.0	58.864	78.007	OK
FEH: 100 years: +45 %: 2160 mins: Winter	73.308	73.280	0.008	0.180	1.3	11.248	0.000	0.000	0.1	1.0	66.099	80.842	OK
FEH: 100 years: +45 %: 2880 mins: Summer	73.308	73.264	0.008	0.164	1.4	9.457	0.000	0.000	0.1	1.0	62.565	83.892	OK
FEH: 100 years: +45 %: 2880 mins: Winter	73.307	73.189	0.007	0.089	1.0	3.595	0.000	0.000	0.1	1.0	70.015	93.876	OK
FEH: 100 years: +45 %: 4320 mins: Summer	73.307	73.185	0.007	0.085	1.0	3.378	0.000	0.000	0.1	1.0	68.797	94.246	OK
FEH: 100 years: +45 %: 4320 mins: Winter	73.306	73.161	0.006	0.061	0.8	2.101	0.000	0.000	0.1	0.7	76.969	96.422	OK
FEH: 100 years: +45 %: 5760 mins: Summer	73.306	73.168	0.006	0.068	0.8	2.473	0.000	0.000	0.1	0.8	74.371	95.788	OK

Project: Beckley Stud (our ref: 73541) 1 in 100yr + 45% CC Event Vegetated Swale		Date: 24/03/2026			
		Designed by:	Checked by:	Approved By:	
		TS			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: GeoSon Limited			

FEH: 100 years: +45 %: 5760 mins: Winter	73.305	73.149	0.005	0.049	0.6	1.608	0.000	0.000	0.1	0.6	83.503		97.261	OK
FEH: 100 years: +45 %: 7200 mins: Summer	73.306	73.158	0.006	0.058	0.7	1.956	0.000	0.000	0.1	0.7	79.237		96.669	OK
FEH: 100 years: +45 %: 7200 mins: Winter	73.305	73.142	0.005	0.042	0.5	1.393	0.000	0.000	0.1	0.5	89.005		97.627	OK
FEH: 100 years: +45 %: 8640 mins: Summer	73.305	73.152	0.005	0.052	0.6	1.696	0.000	0.000	0.1	0.6	84.421		97.111	OK
FEH: 100 years: +45 %: 8640 mins: Winter	73.304	73.138	0.004	0.038	0.5	1.275	0.000	0.000	0.1	0.5	94.477		97.828	OK
FEH: 100 years: +45 %: 10080 mins: Summer	73.305	73.146	0.005	0.046	0.6	1.533	0.000	0.000	0.1	0.6	88.969		97.388	OK
FEH: 100 years: +45 %: 10080 mins: Winter	73.304	73.136	0.004	0.036	0.4	1.196	0.000	0.000	0.1	0.4	99.139		97.962	OK

Appendix F



Swale Cross-Section Schematic

1:3 Side Slope

Ground Level

500mm

1500mm

2000mm

1500mm

Swale Longitudinal Plan

73.80m AOD

73.30m AOD

Inflow

73.10m AOD

Outlet

73.60m AOD

73.12m AOD

500mm

1:3 Side Slope

Distance 35m | Fall 0.2m | Slope 1:175

Distance 20m | Fall 0.02m | Slope 1:1000

Not to scale

Swale Specification

US GL: 73.80

US IL: 73.30

DS GL: 73.60

DS IL: 73.10

Base Length: 55m

Base width: 2.0m

Base Vegetated Area: 110m²

GL width: 5.0m

Attenuation volume: 58.712m³

Side slope: 1 in 3

Residual Hazards

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following:

Buried services. Contractor to refer to record drawings and use CAT to locate existing services and undertake necessary precautions and investigation prior to excavating.

Working in live traffic. Contractor to ensure traffic management is designed, erected and maintained to protect the workforce and the public. Contractor to undertake necessary precautions and ensure suitable traffic management is in place prior to commencement.

Working in live sewers. Contractor to ensure operatives are familiar and competent with the dangers of working in live sewers.

Excavations close to existing structures. Contractor to prepare method statement to ensure stability of existing structure.

Working in vicinity of Waterbodies with variable surface water flows & debris. Contractor to provide method statement and ensure operatives have appropriate safeguarding equipment.

Existing overhead wires/services. Contractor to be aware of overhead wires /services and should prepare a method statement where appropriate.

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved risk assessment and method statement.

Final cover and invert levels of all surface water drainage infrastructure to be confirmed on site by the site engineer / contractor.

 Roof Area (550m²)

 Rainwater Butts

○ Proposed Surface Water Manhole

● Assumed Downpipe Locations

Proposed Flow Controls

 Proposed Outfall

Existing Drainage Ditch

← Potential Overland Flow Route

All dimensions in this drawing are in millimetres unless stated otherwise. All levels are in metres above Ordnance Datum (mAOD).

A.2. As such, final site levels shall be confirmed by the topographic survey produced by Foreside Geomatics in October 2025 before used to determine ground levels across the site.

The topographic survey does not cover land to be confirmed by a topographic survey undertaken to mAOD prior to construction.

The invert level of the receiving drainage ditch has been estimated based on EA LADRA data and the photographs provided by the engineer. The proposed invert levels of the drainage ditch should be confirmed by the topographic survey prior to construction.

The topographic survey findings will be used by the site engineer to determine the final SuDS invert level/overall level.

The proposed drainage ditch should be located upon land to the west of the sand school will provide sufficient storage to accommodate all rain generated by 550m² of impermeable areas during the 1 in 100 year (2% AEP) climatic event. The proposed drainage ditch should be 1.5m deep, 2.0m wide (base) and 500mm deep.

A scale of these dimensions will provide adequate storage to accommodate all roof runoff from the 100m² +45% CWC Discharge (while limiting discharge to the drainage ditch to 1.0/s), will meet the interception requirements and will provide wider biodiversity and amenity benefits.

Discharge of SuDS system to the on-site drainage ditch will be restricted to a maximum rate of 1.0 l/s (subject to receipt of Ordinary Watercourse Consent from West Sussex County Council).

No deep rooted vegetation should be planted within proximity of the drainage ditch to prevent ground erosion.

It is currently unknown whether there are any additional utilities beneath the site.

Any information given regarding existing underground services is given for information only after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care to ensure that no underground services are damaged.

The site engineer / main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.

The main contractor is responsible for dealing with all occurrences of ground water during the construction period.

The contractor must comply with all current legislation relating to health & safety.

The contractor is responsible for dealing with any existing drainage infrastructure discovered on site and should report condition and connectivity to the site engineer at the first opportunity.

All products specified shall be installed in strict accordance with the manufacturers recommendations.

Due to the discrepancies between that information and the details on any GeoSan drawings, the manufacturers instructions must be used.

GeoSan accepts no responsibility for inaccuracies in data provided by the contractor or for errors in the survey mapping.

Do not scale from this drawing.

Equine America UK Ltd

Drainage Layout Plan

Beckley Stud, Reeds Lane, Southwater

Drawing Number: 73541-01		Revision: v1.0	
Date: 24/03/2026		Scale: 1:200	
Designed By: TS	Checked By: -	Approved By: TS	

The drawing(s) provided are for planning purposes only.
Not for construction.

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Appendix G

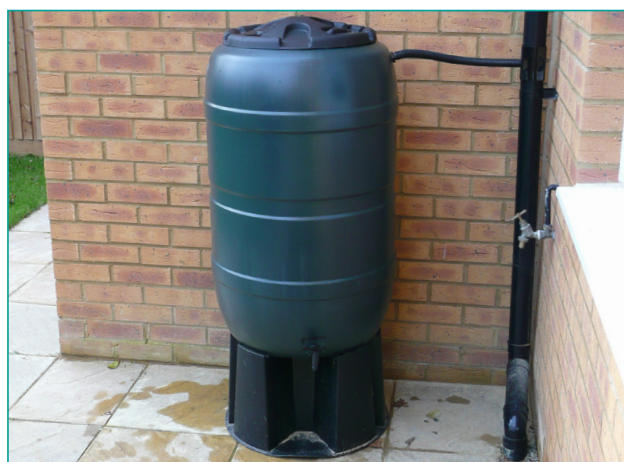
100L & 210L Water Butts and Rainwater Diverters





Product	Code
	WB100
	ST100
	WB200
	ST200

Product	Code
 Rainwater Diverter Connects to 65mm square and 68mm round downpipe (not available in sand).	RVS1
 Connector Kit (not available in brown, grey, sand or "cast iron" Style).	RVS2
 Rainwater Diverter Connects to 80mm Round Downpipe (not available in "cast iron" Style).	RVH1
 Rainwater Diverter Connects to 50mm round downpipe (not available in sand or "cast iron" Style).	RVM1
 "Cast Iron" Style Rainwater Diverter Connects to 65mm square and 68mm round downpipe.	RVS1CI



100L SLIM WATER BUTT

- 100L capacity.
- Space saving water butt ideal where space is at a premium.
- Supplied with tap and lid.
- Manufactured in the UK from recycled materials.

Dimensions

Water Butt:

32cm (12½") Length
 36cm (14") Width
 95.2cm (37½") Height

Stand:

33cm (13") Length
 33cm (13") Width
 30.5cm (12") Height

210L SLIM WATER BUTT

- 210L capacity.
- Traditional shape water butt with a large capacity.
- Supplied with tap and childproof lid.
- Manufactured in the UK from recycled materials.

Dimensions

Water Butt:

57cm (22½") Diameter
 97cm (38") Height

Stand:

53cm (21") Diameter
 31cm (12") Height