

SuDS and Drainage Report

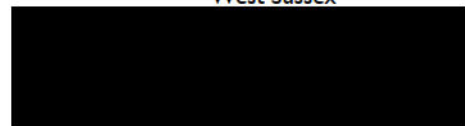
Neslted, Land to south of The Black Horse Pub, Binstead Farm, Binstead Lane,
Walberton BN18 0LP

Planning Ref: WA/21/25/PL

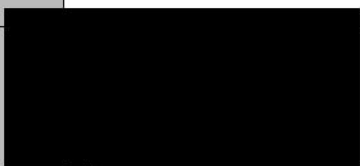
Rev: **P**

Ref: **C3944**

CGS Civils Ltd
Richard Cobden House
Lion Street
Chichester
West Sussex



Document Control

Project Number	C3944		
Date	26/03/2026	Revision	
Author	Luke Honeywill	Signature	

Revision History

Date	Revision	Author	Approved
26/03/2026	I	LH	CS



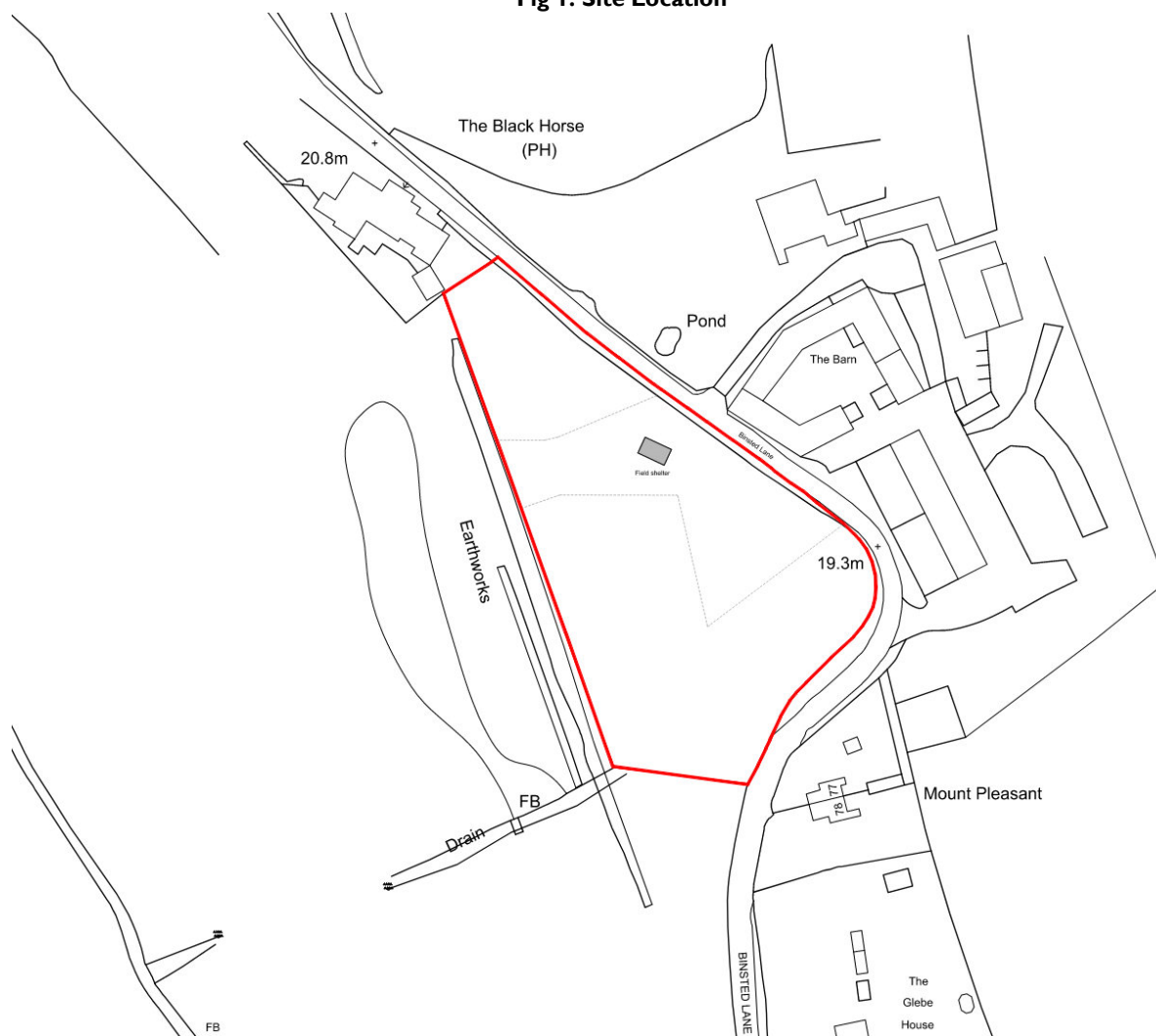
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1 Introduction

- 1.1.1 CGS Civils Ltd has been appointed to undertake a drainage strategy report for a proposed development at Nestled, Land to the south of The Black Horse Pub, Walberton.
- 1.1.2 The proposed development will consist of the construction of 6 No. glamping pods with associated access, car parking and landscaping. The proposed development is located as OS Grid Reference SU 98105 06329 and has the post code BN18 0LP.
- 1.1.3 The purpose of this drainage scheme is to demonstrate how the proposed development can be satisfactorily drained without increasing flood risk onsite and where appropriate, providing betterment over the existing site to reduce flood risk in the region.

Fig 1. Site Location



2 Executive Summary:

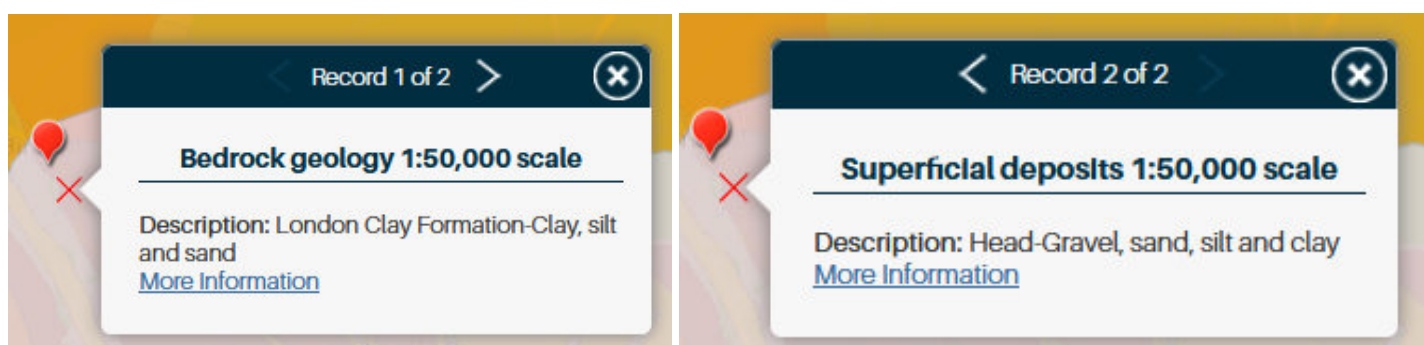
- 2.1.1 The proposed site consists of the construction of 6 No. glamping units with associated access, car parking and landscaping.
- 2.1.2 The underlying geology is noted to be London Clay Formation which is comprised of Clay, Silt and Sand. Infiltration testing was carried out on site which recorded a worst case infiltration rate of $1.09 \times 10^{-5} \text{m/s}$ which is considered a fair rate.
- 2.1.3 In addition to the infiltration testing, winter groundwater monitoring was conducted between November 2025 and March 2026. During this period, the highest recorded groundwater level was 1.0mbgl, which rules out the use of infiltration features as per the latest National Standards for SuDS.
- 2.1.4 It is therefore proposed that all surface water runoff is to be discharged into an existing watercourse located to the south of the site. The discharge rate is to be restricted to 1.9l/s which is the recorded greenfield runoff rate. The surface water network will make use of a detention basin in order to cater for the 1 in 100-year +45% storm. The proposed parking area is to be constructed from a tanked permeable surface which will allow the sub-base to act as blanket attenuation. The runoff is to then discharge into the drainage network prior to discharging into the watercourse to the south.

3 Site Geology

3.1 British Geological Survey information

- 3.1.1 The British Geological Survey confirms the bedrock geology to be made up of London Clay Formation, which is comprised of Clay, Silt and Sand. The BGS website confirms the superficial deposits on site to be made up of Head formation which is comprised of Gravel, Sand, Silt and Clay.
- 3.1.2 The British Geological survey also holds records of historical boreholes near the site which give some insight into the ground geology.
- Borehole SU90NE42 (Located on site) – Clayey Gravel, Silty Sandy Clay and Clay.

Fig 2. British Geological Survey



3.2 Geological Assessment

- 3.2.1 Infiltration testing was carried out within a shallow trial pit which recorded a worst-case infiltration rate of 1.09×10^{-5} m/s which is considered a fair rate.
- 3.2.2 A groundwater monitoring well was installed on site by E3S Consulting Ltd in November 2025. During excavation of the well it was noted that the underlying geology is comprised of gravelly clay to a depth of 1.2mbgl followed by Clay to the bottom of the well at 4.0mbgl.
- 3.2.3 Subsequent groundwater monitoring visits were conducted by CGS Civils with the highest groundwater level being recorded at 1.0mbgl. As per the latest national SuDS standards, the use of infiltration features are confirmed to not be viable and an alternative means of surface water disposal is to be sought.

4 Existing Drainage

- 4.1.1 There is no existing drainage on the site. An existing watercourse is noted to be present within the southern corner of the site.

5 Proposed Drainage Strategy

5.1 SuDS Hierarchy

- 5.1.1 All options for the destination of run-off generated on site have been assessed in line with the SuDS hierarchy as set out in Building Regulations Part H document and DEFRA's Draft National Standards for SuDS.

Table 1. SuDS Hierarchy

Discharge Destination	
Rainwater Harvesting	Yes rainwater harvesting tanks are to be provided.
Discharge to Ground	No – Despite a favourable infiltration rate, the winter groundwater level rules out use of infiltration features.
Discharge to Watercourse	Yes – Proposed discharge to existing watercourse within southern corner of the site. Discharge rate to be restricted to 1.9l/s.
Discharge to Surface Water Sewer	N/A due to above
Discharge to Other Sewer	N/A due to above

5.2 Proposed Hydraulic Calculation Specifications:

Table 2. SuDS Hierarchy

Hydraulic Calculations Settings:	
Rainfall Methodology	FEH-22
Volumetric Run-off Coefficient Cv	1
CV Winter and Summer	1
Additional Storage (m ³ / ha)	0.0
Maximum Rainfall (mm/hr)	75
Detention basin design	Base Coefficient (m/hr): 0.00000
	Side Coefficient (m/hr): 0.00000
	Factor of Safety: 2
	Porosity: 100%
	Time to Half Empty (mins): -

5.3 Surface Water Drainage

- 5.3.1 Despite the favourable infiltration rate recorded, the use of infiltration features are not viable due to the recorded groundwater level. Therefore, it is proposed that all surface water runoff is to be discharged into an existing watercourse located at the southern boundary of the site.
- 5.3.2 All runoff from roof areas are to be captured into a positive drainage network prior to discharging at a restricted rate of 1.9l/s which is the site's recorded Q_{BAR} . The proposed drainage network will make use of a detention basin in order to cater for the 1 in 100-year +45% storm period.
- 5.3.3 The proposed parking area is to be constructed from a tanked permeable surface which will allow the sub-base to act as blanket attenuation. The runoff is to then discharge into the drainage network prior to discharging into the watercourse to the south.
- 5.3.4 Each glamping pod will also utilise rainwater harvesting for re-use within the units.
- 5.3.5 Hydraulic and greenfield runoff calculations have been carried out which can be found at Appendix C.

Table 3. Greenfield Runoff Calculations

Greenfield Runoff Calculations			
Storm period	Greenfield runoff rate (l/s)	Proposed Discharge Rate (l/s)	Difference (l/s)
Q _{BAR}	1.9	1.9	+ 0.0
1	1.6	1.9	+ 0.3
2	1.7	1.9	+ 0.2
30	4.3	1.9	- 2.4
100	6.0	1.9	- 4.1

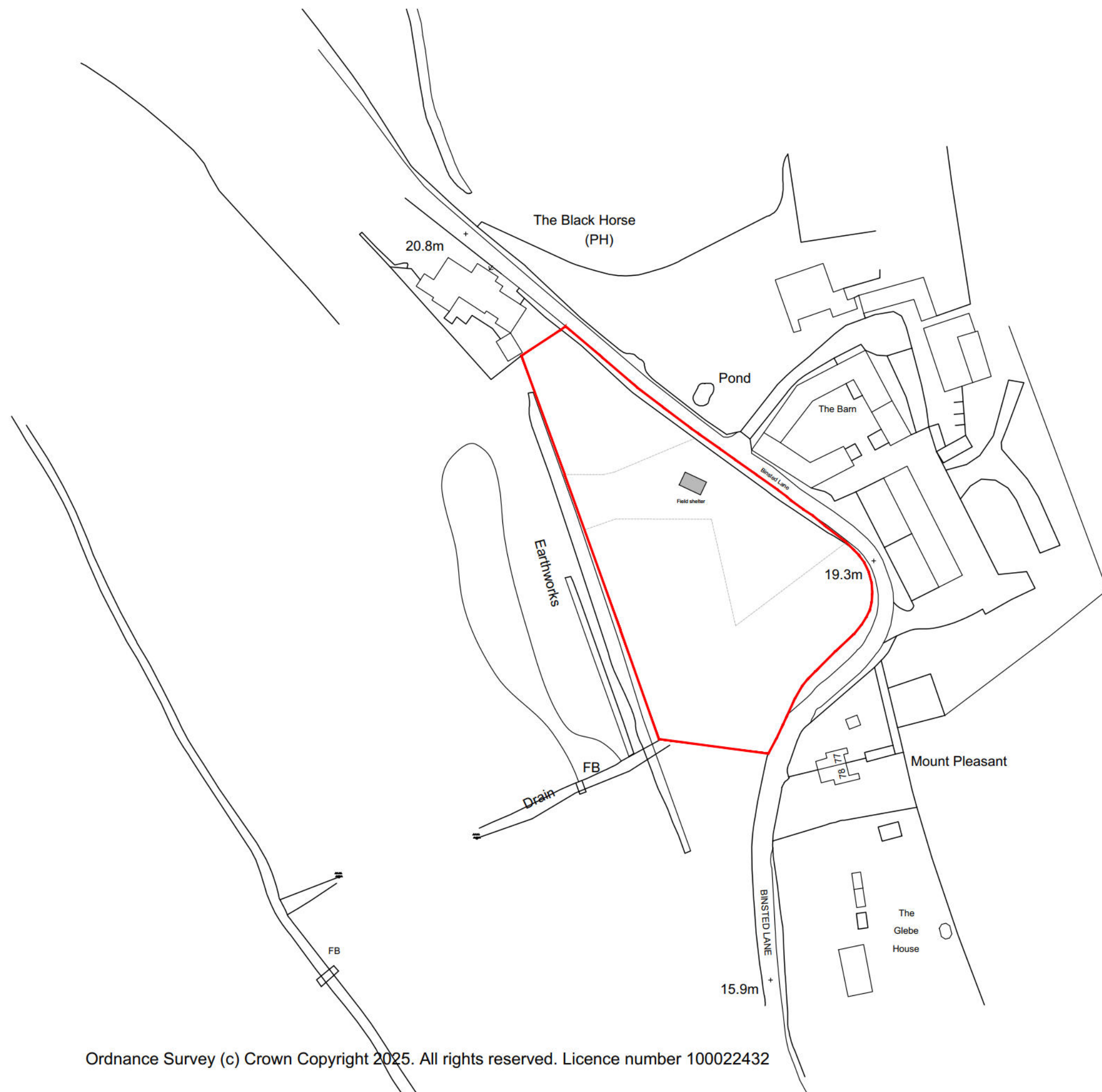
6 Summary and Conclusions

- 6.1.1 CGS Civils has been instructed to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for the construction of 6 No. glamping pods, car parking and landscaping.
- 6.1.2 It is therefore proposed that all surface water runoff is to be discharged into an existing watercourse located to the south of the site. The discharge rate is to be restricted to 1.9l/s which is the recorded greenfield runoff rate. The surface water network will make use of a detention basin in order to cater for the 1 in 100-year +45% storm.
- 6.1.3 The proposed parking area is to be constructed from a tanked permeable surface which will allow the sub-base to act as blanket attenuation. The runoff is to then discharge into the drainage network prior to discharging into the watercourse to the south.
- 6.1.4 The report has demonstrated that the proposed drainage measures ensure that suitable means of surface water drainage can be achieved for the proposed development.

7 Appendices

7.1 Appendix A – Site Plan

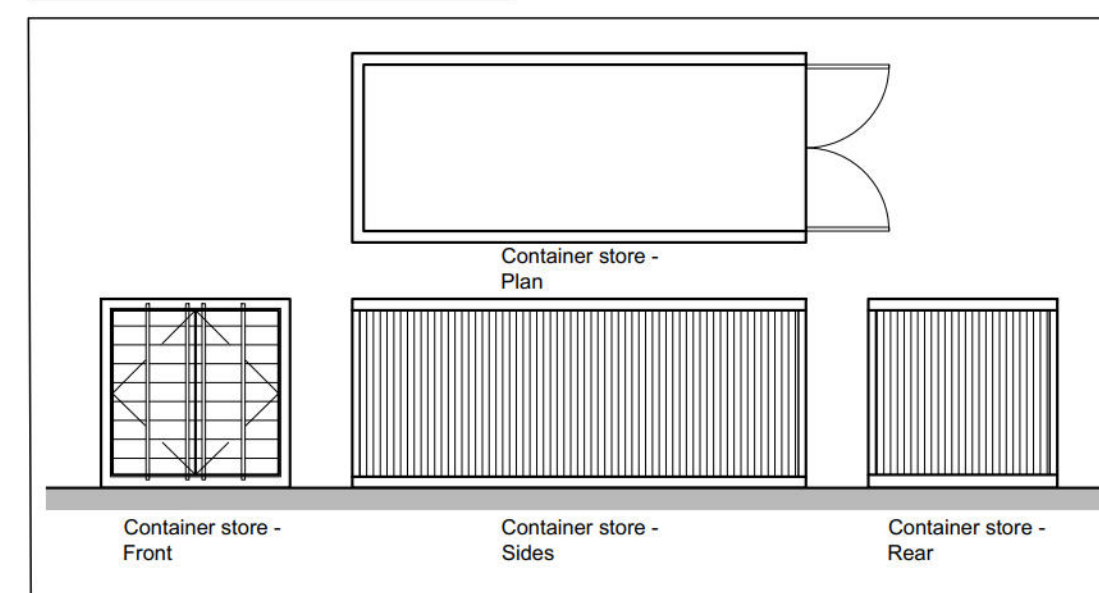
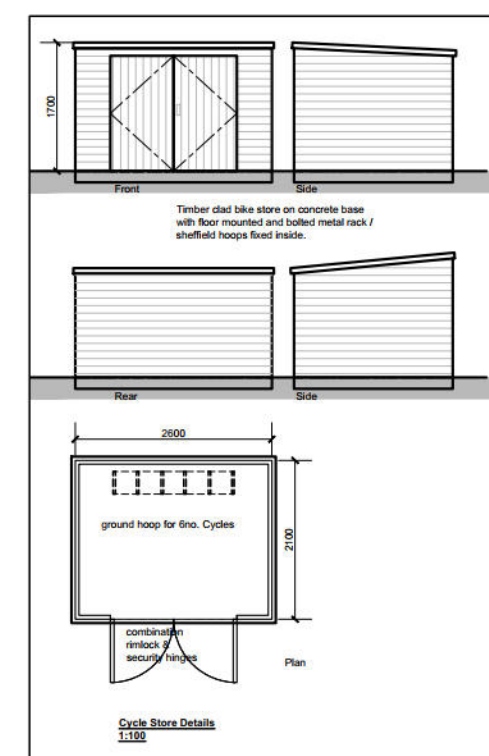
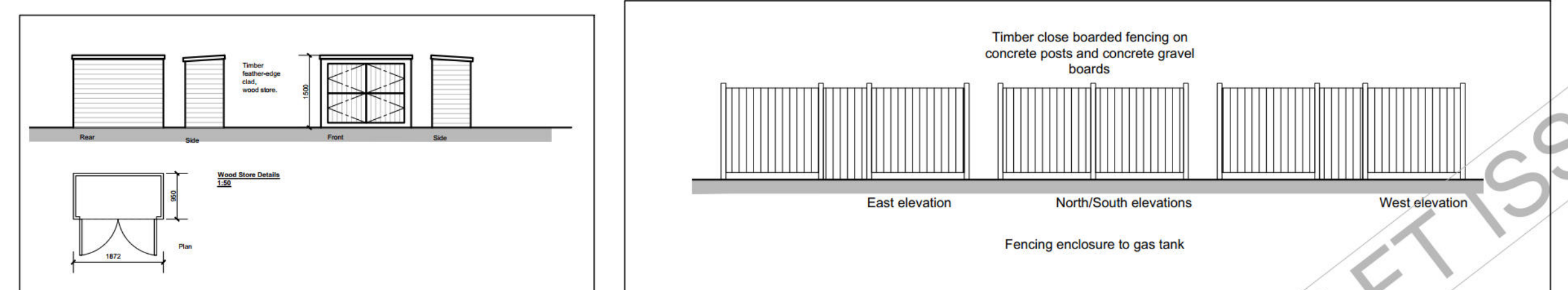
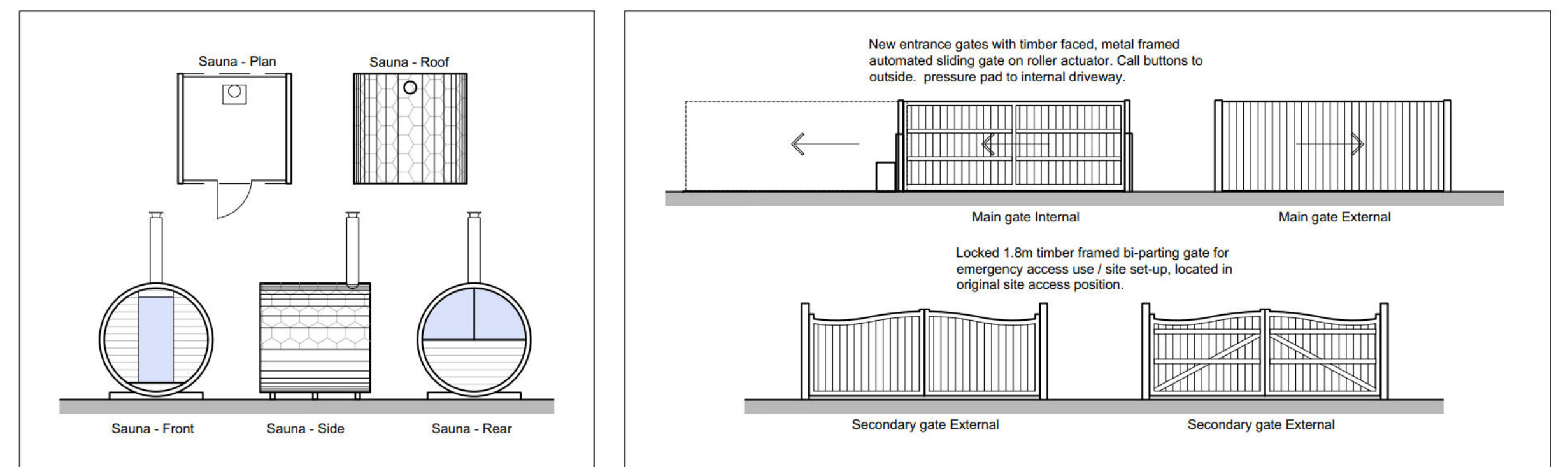
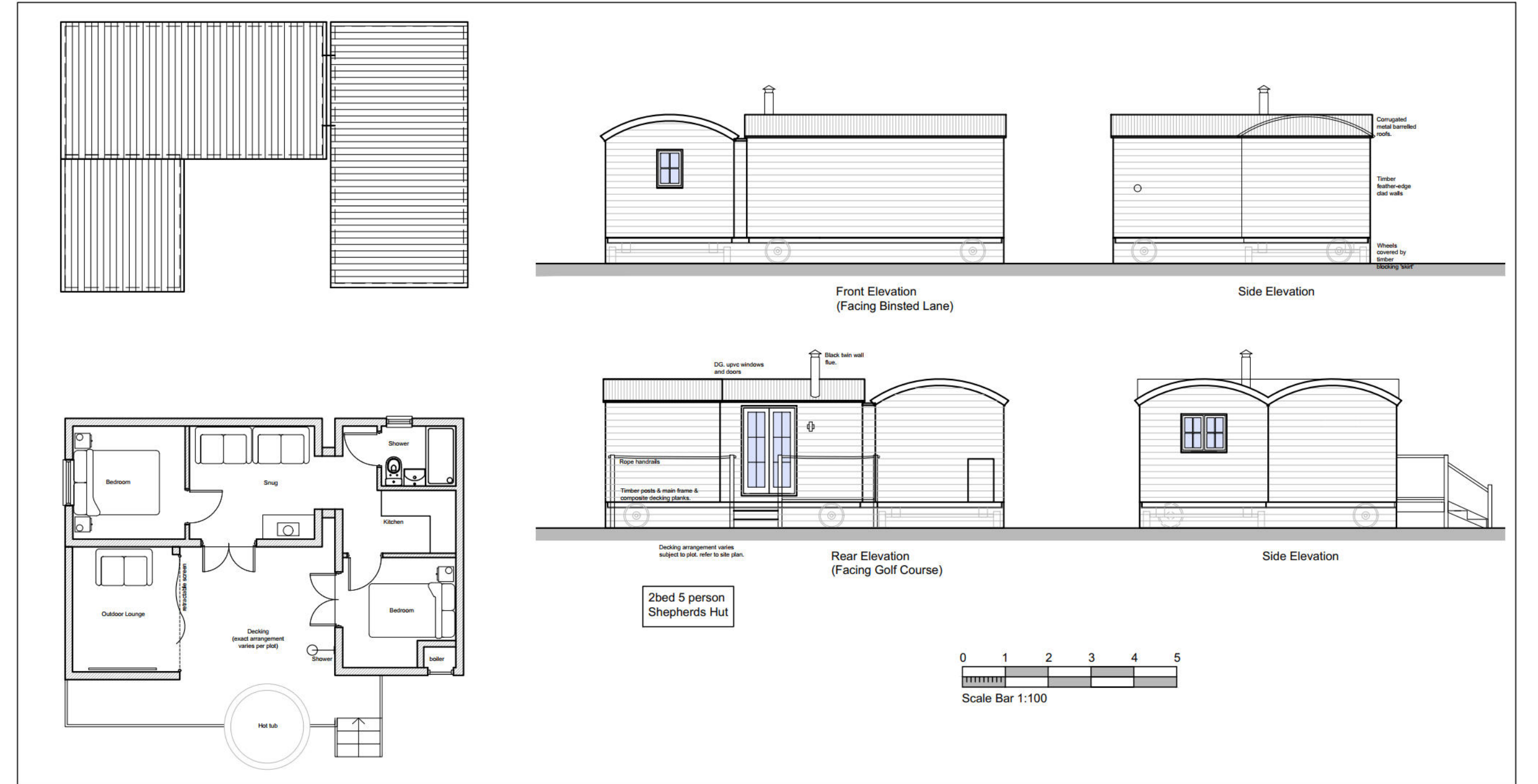
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PLANNING

A - Issued for Planning - 21.03.2025	
Revision	
	SIMON HARVEY DESIGNS LTD 2 Greenfield Way, Storrington, West Sussex. RH20 4PY t: 07833 178649 e: office@simonharveydesigns.com
Client: Binsted Farms Ltd	
Project: Proposed glamping site to field west of Church Farm	
Address: Binsted Lane, Binsted, Nr Arundel, West Sussex. BN18 0LN	
Drawing Title: SITE LOCATION PLAN	
Drawing Number: 148_01	
Date: February 2025	Scale: 1:1250 @A3



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C - Amendments to scheme re-submitted to regularise as-built arrangements. Re-issued for Planning. - 06.02.2026

B - New Hedging length confirmed. Pedestrian access gate added for surface water / flood egress. Re-issued for Planning - 07.05.2025

A - Issued for Planning - 21.03.2025

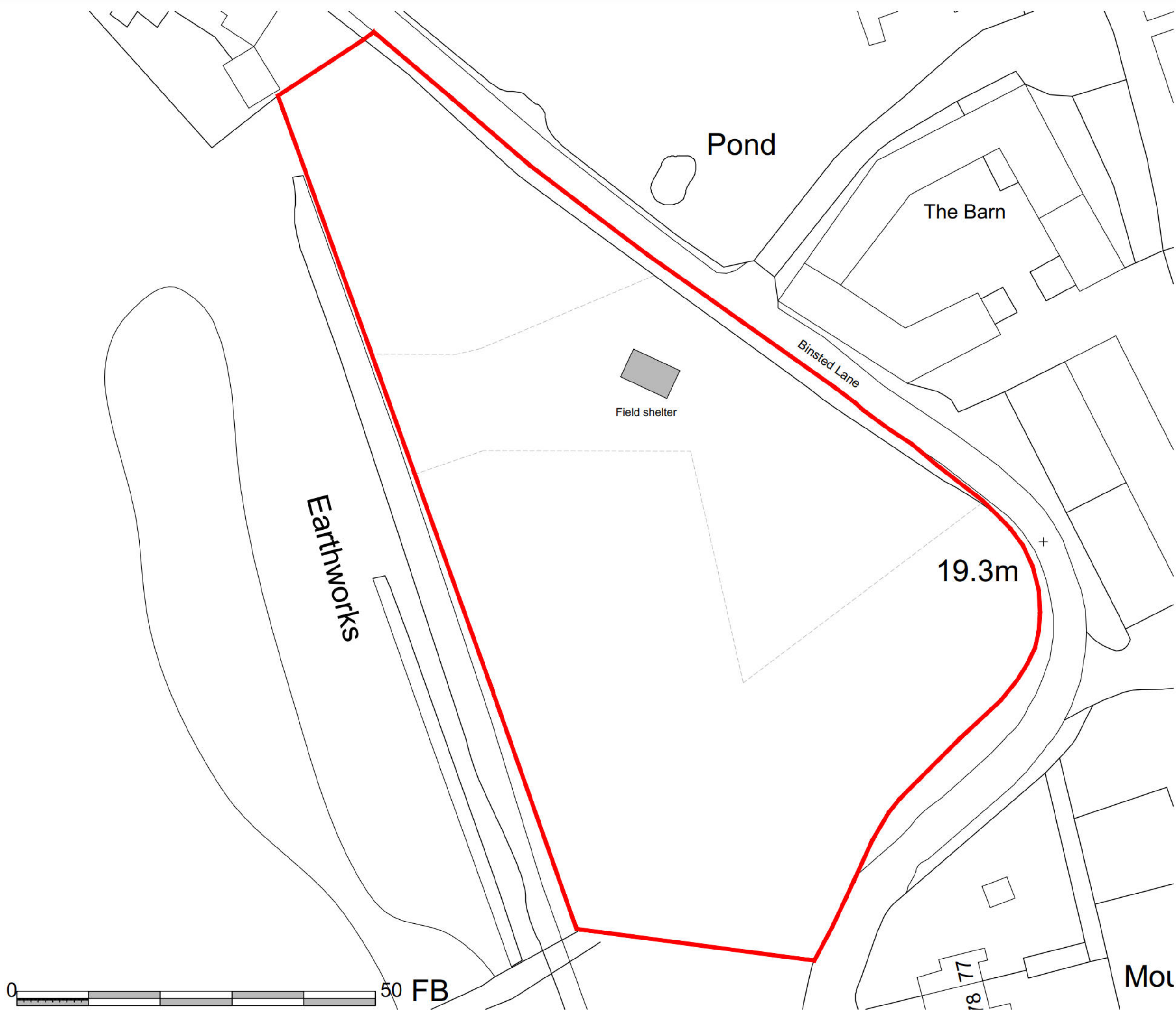


Client: Binstead Farms Ltd
Project: Proposed glamping site to field west of Church Farm
Address: Binstead Lane,
Binstead,
Nr Arundel,
West Sussex.
BN18 0LN

Drawing Title: PROPOSED ARRANGEMENT
Drawing Number: 148_02
Date: February 2025
Scale: 1:500 / 1:100 @A1

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A - Issued for Planning - 21.03.2025

Revision



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Client: Binsted Farms Ltd

Project: Proposed glamping site to
field west of Church Farm

Address: Binsted Lane,
Binsted,
Nr Arundel,
West Sussex.
BN18 0LN

Drawing Title: EXISTING SITE BLOCK PLAN

Drawing Number: 148_03

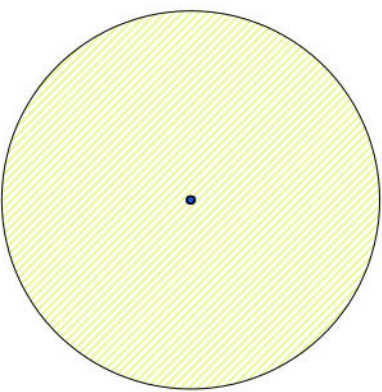
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PLANNING



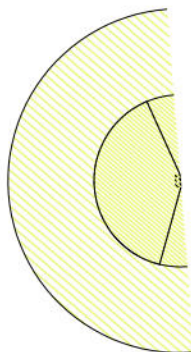
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PROPOSED LIGHTING LEGEND:



LED Outdoor Rusty Square 40 - Bollard lighting to highlight pathways and access steps. 400mm high with 3000K Warm Light - 1000Lumens -

Wired on down to dusk sensors, providing intermittent low level path finder use and reduced spill and night-time light emissions, maintaining dark skies continuity.



PIR activated wall mounted bulkhead light.

Philips LED wall light Arbour UE with 2,700 K Warm Light - 800 Lumens, 30-200Lux

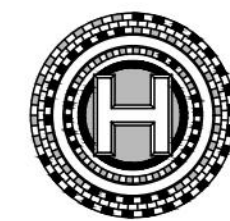
Wall mounted unit (set to wall of Shepherds Hut, under roof overhang) with 10m motion sensor range. The lighting duration can also be adjusted, namely within a time frame of 5 seconds to maximum 12 minutes. Proposed to be set to 6 minutes and therefore providing intermittent use and reduced spill and night-time light emissions, maintaining dark skies continuity.

DRAFT ISSUE
FOR DISCUSSION

B - Amendments to scheme re-submitted to regularise as-built arrangements. Re-issued for Planning. - 05.02.2026

A - Issued for Approval - 26.08.2025
Revision

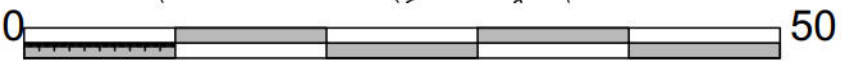
PLANNING



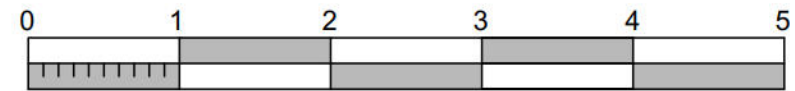
SIMON HARVEY DESIGNS LTD
2 Greenfield Way,
Storrington,
West Sussex,
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Client: Binstead Farms Ltd
Project: Proposed glamping site to field west of Church Farm
Address: Binstead Lane,
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BN18 0LN

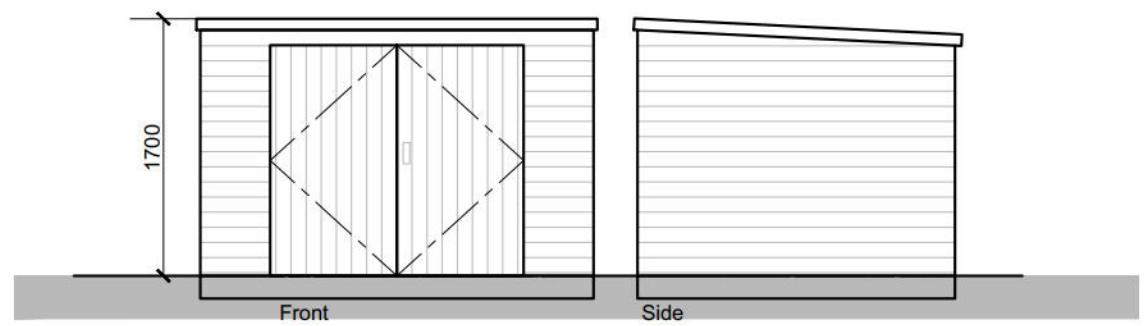
Drawing Title: PROPOSED LIGHTING PLAN
Drawing Number: 148_06
Date: August 2025 Scale: 1:250 @A1



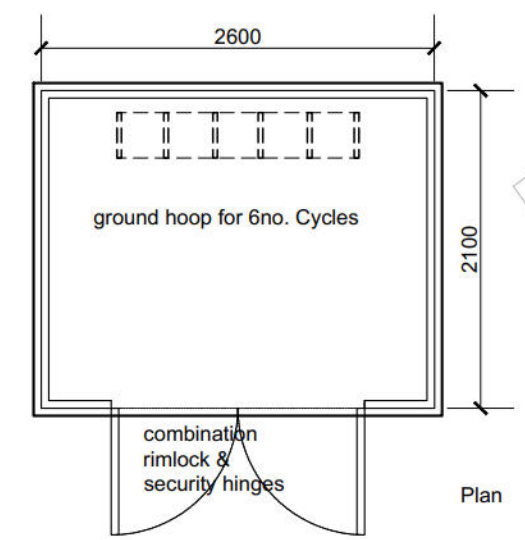
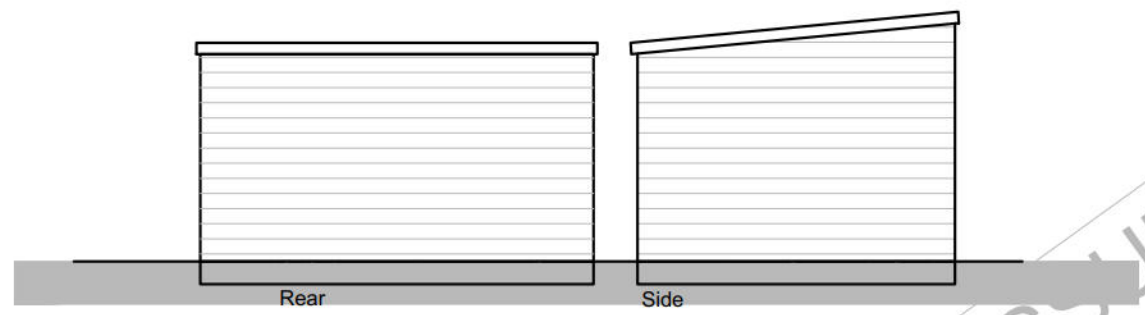
SITE PLAN SHOWING CYCLE STORE
1:500



Scale Bar 1:50



Timber clad bike store on concrete base
with floor mounted and bolted metal rack /
sheffield hoops fixed inside.



Cycle Store Details
1:100

DRAFT ISSUE
FOR DISCUSSION

B - Amendments to scheme re-submitted to
regularise as-built arrangements. Re-issued
for Planning. - 05.02.2026

A - Issued for Approval - 26.08.2025

Revision



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Client: Binsted Farms Ltd

Project: Proposed glamping site to
field west of Church Farm

Address: Binsted Lane,
Binsted,
Nr Arundel,
West Sussex.
BN18 0LN

Drawing Title: CYCLE STORAGE

Drawing Number: 148_07

Date: August 2025

Scale: 1:50 / 1:500 @A3

PLANNING

7.2 **Appendix B – Drainage Layout**

DESIGN SUBJECT TO THE APPROVAL OF:
PLANNING AUTHORITY
BUILDING CONTROL
WATER AUTHORITY

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN
ORDINARY WATERCOURSE APPROVAL
LOCATION AND DEPTH OF EXISTING UTILITIES
ROOT PROTECTION AREAS



- STANDARD DRAINAGE NOTES
- DO NOT SCALE FROM THIS DRAWING. REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
 - ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
 - THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
 - ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
 - BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
 - ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT. THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY.
 - COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
 - ALL UN-REFERENCED PIPES ARE TO BE 100mm DIA.
 - ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 295 AND BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911:PART 1.
 - ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
 - ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION LAID DOWN IN 'SEWERS FOR ADOPTION' 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
 - ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
 - THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINING, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
 - STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
 - IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. SUB SOIL DRAINAGE ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER.
 - NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
 - ALL EXISTING MANHOLE COVERS, GULLIES, ETC. ARE TO BE RAISED/LOWERED TO SUIT NEW LEVELS.
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT.
 - UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION.
 - PROPRIETARY PRODUCTS TO BE INSTALLED IN FULL ACCORDANCE WITH MANUFACTURER'S GUIDANCE.
 - MANHOLE AND CHAMBER COVER GRADES:
 - 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
 - 'B125' IN ALL DRIVEWAYS
 - 'C250' IN PRIVATE PARKING AREAS
 - 'D400' IN CARRIAGEWAY/ACCESS ROAD

DRAINAGE LEGEND

PROPOSED FEATURES

- SWD → Surface Water Drainage
- Storm water access chamber (3000)
- Storm water inspection chamber (4500)
- Storm water catchpit chamber (4500)
- Storm water orifice flow control chamber (5000)
- Extent of tanked permeable paving with attenuated sub-base
- 00.000 Finished floor level
- 1000 4.5m 1:100 Z BED
- Pipe info - diameter, length, gradient, bedding type

ABBREVIATIONS

- MH - MANHOLE
IC - INSPECTION CHAMBER
AC - ACCESS CHAMBER
CP - CATCHPIT
BC - BRAKE CHAMBER
RE - RODDING EYE
IL - INVERT LEVEL
SL - SUMP LEVEL
RA - RESTRICTED ACCESS COVER
CL - COVER LEVEL
TL - TOP OF CELLULAR SA
BL - BASE OF CELLULAR SA
FL - FORMATION LEVEL

Prefixed to drawing numbers shall signify the following:-

PL = PLANNING **Shall not be used for contract or construction purposes**

P = PRELIMINARY **Shall not be used for contract or construction purposes**

T = TENDER **Shall not be used for construction purposes**

C = CONSTRUCTION These are the only drawings that shall be used for construction purposes

R = RECORD Record of actual completed work

P-	30.03.26	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP

 Consulting Civil Engineers					
CLIENT BINSTEAD FARMS LTD					
ARCHITECT SIMON HARVEY DESIGNS LTD					
JOB TITLE NESTLED, LAND ADJ BINSTEAD LANE BINSTEAD, ARUNDEL					
DRAWING TITLE DRAINAGE STRATEGY					
DRAWN	ENGINEER	CHECKED	APPROVED		
LH	C SLADE	CS	CS		
DATE	JAN 2026	SCALE @ A1	1:200		
JOB No.	C3944	STATUS	DRAWING No.	REV.	
	PL		101	PL-	

FOR PLANNING ONLY

- Site Specific Notes
- The proposed scheme consists of the construction of 6 No. glamping pods with associated access, car parking and landscaping.
 - The underlying geology is noted to be comprised of gravelly clay to a depth of 1.2mbgl followed by clay. Infiltration testing was conducted on site which recorded a worst case infiltration rate of 1.09x10⁻³m/s which is considered a fair rate.
 - In addition to the infiltration testing, winter groundwater monitoring was carried out and a groundwater level of 1.0mbgl was recorded which rules out the use of infiltration features.
 - It is therefore proposed that all surface water runoff is to be discharged into an existing watercourse to the south of the site. The discharge rate is to be restricted to 1.9 l/s, which is the recorded greenfield runoff rate.
 - The site will make use of a detention basin in order to cater for the 1 in 100-year +45% storm.
 - The car park is to be constructed from a tanked permeable surface which will allow the sub-base to act as blanket attenuation and will be connected to the rest of the drainage network.
 - Each glamping unit will utilise a rainwater harvesting tank to allow for re-use within the units.

Detention Basin

Top of banking: 17.200 - 17.000
Inlet pipes 1500 IL: 16.250
Basin base Level: 16.250
Depth 0.750m

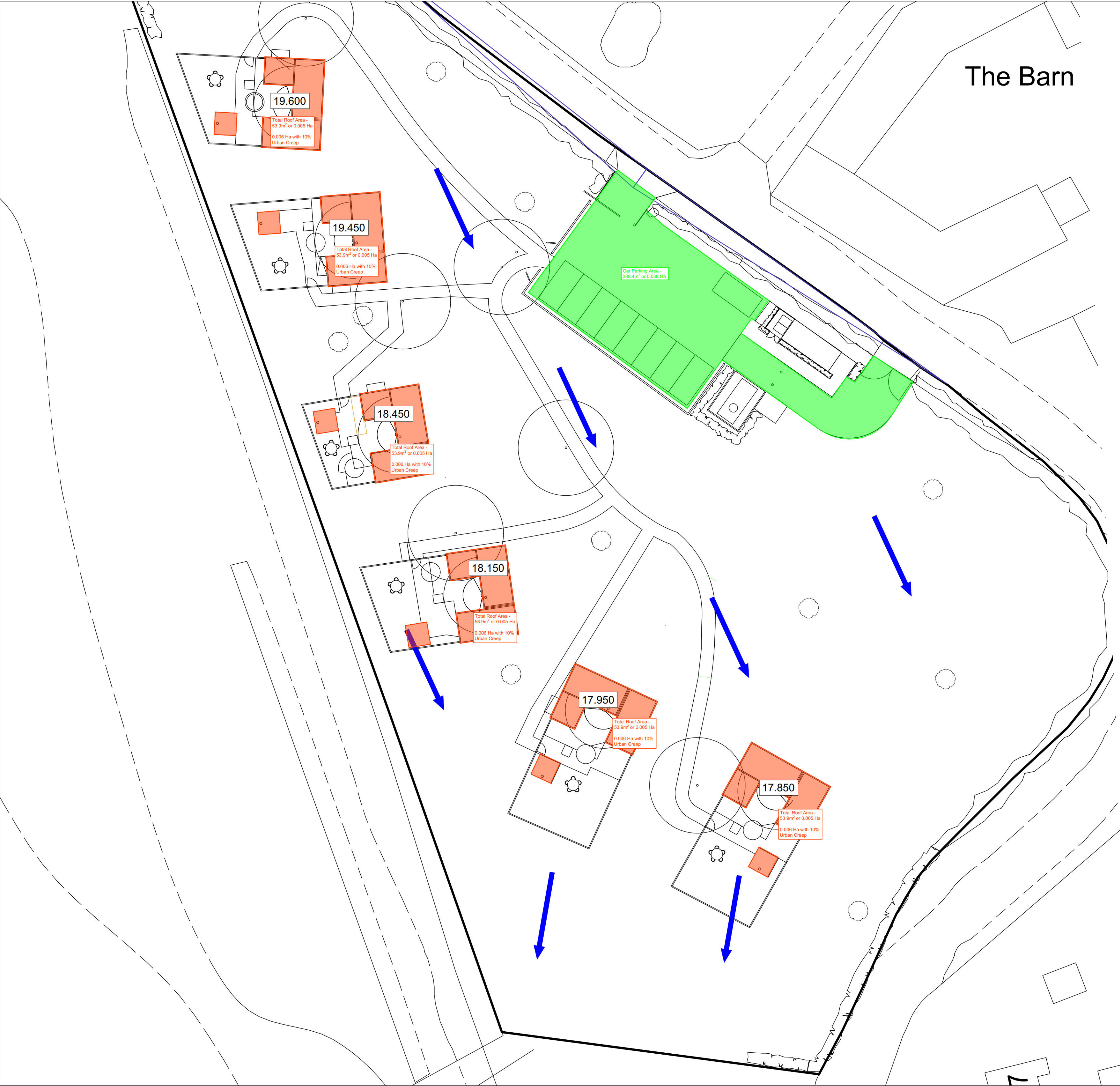
A storage volume of 54.66 m³ is provided to accommodate the Designed to 1 in 100-year storm event, including a 45% allowance for climate change

S23 Control Chamber
SEL Protected Office
(or similar approved)
Orifice = 31mmØ
MAX 1.9 l/s
CL: 16.900
IL: 16.191
SL: 15.891
5000 SEL Chamber

WARNING

NO PART OF HEADWALL STRUCTURE IS TO ENCROACH INTO THE DITCH PROFILE

Ditch downstream to be cleared of all debris before commencement of works



BLUE ARROWS SHOW ROUTE OF EXCEEDANCE FLOWS FROM PROJECTED POINTS OF EMERGENCE TOWARDS DIRECTION OF FALL.

ALL STRUCTURES DESIGNED TO ACCOMMODATE BELOW GROUND THE CRITICAL 1 IN 100 YEAR STORM EVENT PLUS 45%. EXCEEDANCE WOULD ONLY OCCUR IN STORMS OF GREATER INTENSITY THAN THIS.

DUE TO THE ROUTES OF EXCEEDANCE SHOWN, A SAFETY FACTOR OF 2.0 HAS BEEN SELECTED FOR INFILTRATION BASIN DESIGN IN ACCORDANCE WITH CIRIA156 TABLE4.6.

Prefixed to drawing numbers shall signify the following:-

PL = PLANNING	Shall not be used for contract or construction purposes
P = PRELIMINARY	Shall not be used for contract or construction purposes
T = TENDER	Shall not be used for construction purposes
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

30.03.26		PRELIMINARY ISSUE	LH	CS	CS										
REV	DATE	DESCRIPTION	BY	CHK	APP										
 Consulting Civil Engineers CLIENT BINSTEAD FARMS LTD ARCHITECT SIMON HARVEY DESIGNS LTD JOB TITLE NESTLED, LAND ADJ BINSTEAD LANE BINSTEAD, ARUNDEL DRAWING TITLE IMPERMEABLE AREAS AND OVERLAND FLOW ROUTE PLAN <table><tr><td>DRAWN LH</td><td>ENGINEER C SLADE</td><td>CHECKED CS</td><td>APPROVED CS</td></tr></table> <table><tr><td>DATE JAN 2026</td><td>SCALE @ A1 1:200</td></tr></table> <table><tr><td>JOB No. C3944</td><td>STATUS PL</td><td>DRAWING No. 401</td><td>REV. PL-</td></tr></table>						DRAWN LH	ENGINEER C SLADE	CHECKED CS	APPROVED CS	DATE JAN 2026	SCALE @ A1 1:200	JOB No. C3944	STATUS PL	DRAWING No. 401	REV. PL-
DRAWN LH	ENGINEER C SLADE	CHECKED CS	APPROVED CS												
DATE JAN 2026	SCALE @ A1 1:200														
JOB No. C3944	STATUS PL	DRAWING No. 401	REV. PL-												

FOR PLANNING ONLY

7.3 **Appendix C – Surface Water Calculations**

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	75.0		

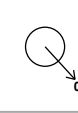
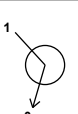
Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S19	0.077	5.00	17.350	Manhole	Adoptable	450	1511.103	213.769	1.032	16.318
BASIN			17.000	Manhole	Adoptable	150	1519.876	204.205	0.750	16.250
S23			16.900	Manhole	Adoptable	450	1517.596	196.343	0.709	16.191

Links (Input)

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	S19	BASIN	12.978	16.318	16.250	0.068	190.9	225
1.001	BASIN	S23	8.186	16.250	16.191	0.059	138.7	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
S19	1511.103	213.769	17.350	1.032	450	Adoptable		0	1.000	16.318	225	Circular
BASIN	1519.876	204.205	17.000	0.750	150	Adoptable		1	1.000	16.250	225	Circular
								0	1.001	16.250	225	Circular
S23	1517.596	196.343	16.900	0.709	450	Adoptable		1	1.001	16.191	225	Circular

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
30	45	0	0
100	45	0	0

Node S23 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.709	Discharge Coefficient	0.650
Replaces Downstream Link	x	Design Flow (l/s)	1.9		
Invert Level (m)	16.191	Diameter (m)	0.031		

Node BASIN Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	16.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	61.6	61.6	0.750	140.1	144.3

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	S19	176	16.719	0.401	12.3	0.0638	0.0000	SURCHARGED
180 minute winter	BASIN	176	16.719	0.469	12.2	40.4044	0.0000	FLOOD RISK
180 minute winter	S23	176	16.719	0.528	2.3	0.0839	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	S19	1.000	BASIN	12.2	0.788	0.325	0.5161	
180 minute winter	BASIN	1.001	S23	2.3	0.236	0.052	0.3256	
180 minute winter	S23	Orifice		1.6				31.5

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S19	232	16.822	0.504	12.3	0.0802	0.0000	SURCHARGED
240 minute winter	BASIN	232	16.822	0.572	12.2	52.4133	0.0000	FLOOD RISK
240 minute winter	S23	224	16.828	0.637	3.5	0.1013	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	S19	1.000	BASIN	12.2	0.777	0.325	0.5161	
240 minute winter	BASIN	1.001	S23	3.5	0.211	0.080	0.3256	
240 minute winter	S23	Orifice		1.7				39.3

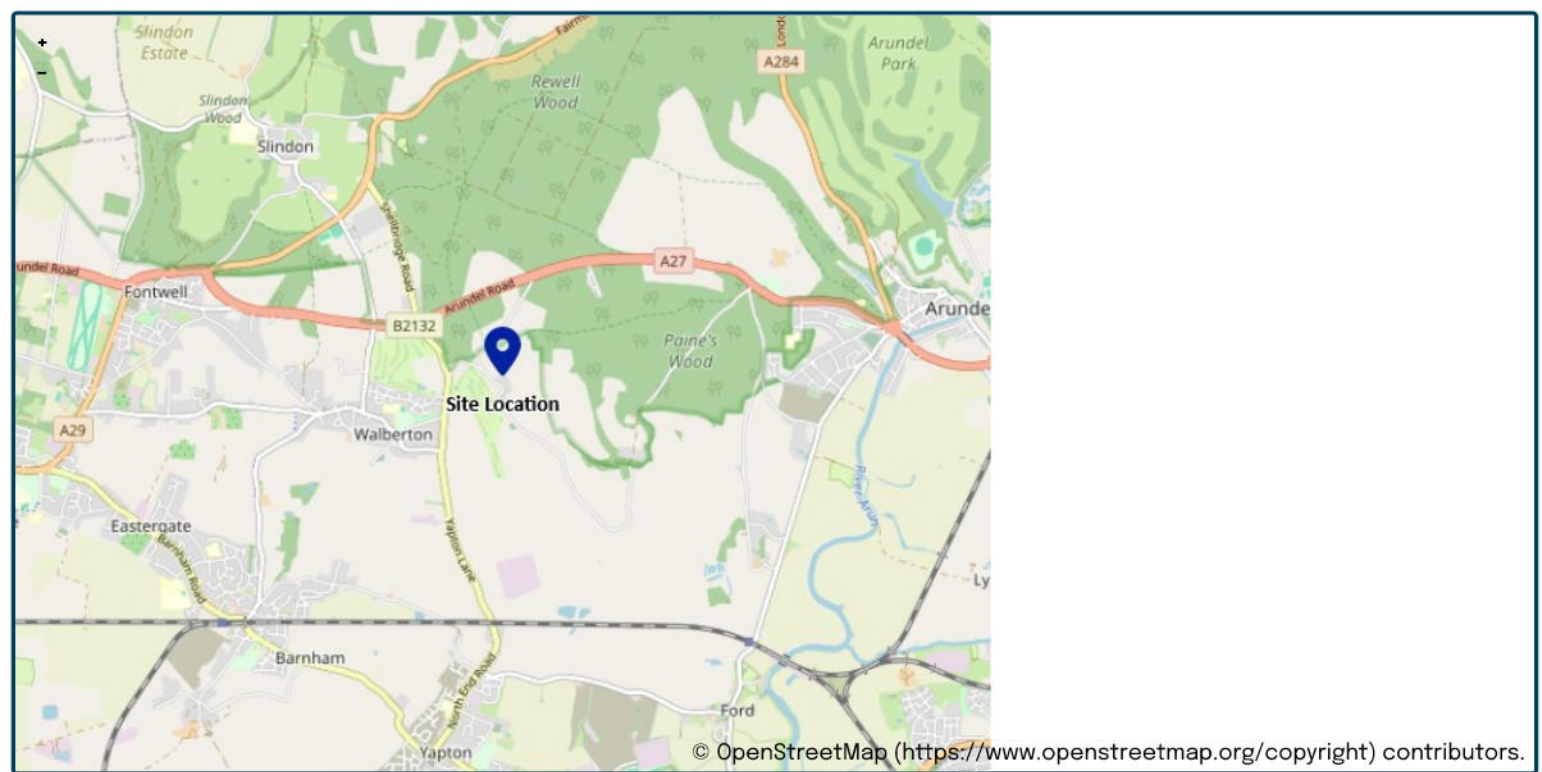
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	26/03/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	NEstled
Site location	



Site easting (British National Grid)	498150
Site northing (British National Grid)	106250

Site details

Total site area (ha)	0.6817	ha
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Greenfield runoff

Method

Method

FEH statistical (2025)
Please select a value.
FEH statistical (2025)
FEH statistical (2008)
IH124

FEH statistical (2025)

SAAR9120 (mm)

My valueMap value

812mm

BFIHOST19scaled

0.617

QMed-QBar conversion

1.136

☐

1.136

QMed (l/s)

1.7l/s

QBar (FEH statistical 2025) (l/s)

1.9l/s

Growth curve factors

Hydrological region

My valueMap value

7

☐

7

Please select a value.

1

2

3

4

5

6

7

8

9

10

11

12

13

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)	1.6	l/s
Flow rate 2 year (l/s)	1.7	l/s
Flow rate 10 years (l/s)	3.1	l/s
Flow rate 30 years (l/s)	4.3	l/s
Flow rate 100 years (l/s)	6.0	l/s
Flow rate 200 years (l/s)	7.1	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/) (<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) (<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.

7.4 **Appendix D – Borehole Logs**



SU 90 NE 42 9806 0638

Church Farm, Binstead

Surface level +20.4 m
Water struck at +19.9 m
October 1981

Block G

Waste 1.6 m
Bedrock 7.4 m+

LOG

Geological classification

Lithology

Thickness
m Depth
m

Head Gravel	Soil with pebbles	0.9	0.9
	'Very clayey' gravel Gravel: coarse and fine; flint Sand: coarse with fine and medium Fines: silt and clay	0.7	1.6
London Clay	Clay, silty, sandy, mottled brown and grey near top, grey below	3.4	5.0
	Clay, very sandy, glauconitic; rare lignite fragments	2.0	7.0
	Clay, hard, olive brown	1.1	8.1
	Clay, crumbly, grey, mottled brown and red, with glauconite and some lignite fragments	0.1	8.2
Woolwich and Reading Beds	Clay, stiff, mottled purple and grey	0.8+	9.0

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
Fines	Sand	Gravel		Fines	Sand		Gravel			
				- $\frac{1}{2}$	+ $\frac{1}{2}$ - $\frac{1}{4}$	+ $\frac{1}{4}$ - 1	+1 - 4	+4 - 16	+16 - 64	+64 mm
25	29	46	0.9-1.6	25	9	7	13	22	24	0

7.5 **Appendix E – Soakage Test Results and Groundwater monitoring**

Percolation Test Report – Shepherds Hut Area

1. Introduction

Percolation testing was undertaken to assess the suitability of the ground adjacent to the proposed shepherds hut locations for a foul drainage infiltration system. Testing was carried out in accordance with standard percolation test methodology, observing the rate at which water infiltrates through the soil between predetermined depth markers.

2. Test Methodology

Three trial pits were excavated close to the proposed foul drainage field positions.

Each pit was formed to the following approximate dimensions:

- 1.0 m long
- 0.30 m wide
- 0.65 m deep

Each pit was filled rapidly with clean water to approximately 75% depth (≈ 490 mm). The time taken for the water level to fall to 25% depth (≈ 160 mm) was recorded. This represents a measured water drop of 330 mm.

The test was repeated in each pit to ensure consistent results and to account for local soil variations.

3. Results

The recorded times for the 330 mm water-level drop were approximately:

- 2 hours 10 minutes (7,800 seconds)

Percolation calculation:

$V_p = \text{time (seconds)} \div \text{depth drop (mm)}$

$V_p = 7,800 \div 330 \approx 24 \text{ s/mm}$

Corresponding infiltration rate:

- $\approx 4.2 \times 10^{-3} \text{ m/s}$
- $\approx 150 \text{ mm/hr}$

4. Interpretation

Guidance for foul drainage fields generally considers:

- 15–100 s/mm → suitable
- <15 s/mm → too permeable
- >100 s/mm → too impermeable

The measured value of 24 s/mm is well within the acceptable range.

5. Conclusion

Based on the results obtained, the ground conditions in the shepherds hut area are suitable for foul effluent infiltration, subject to detailed design and regulatory compliance.

Project:	Nestled Walberton	GW1
Project No:	C3944	
Client:	Binstead Farms Ltd	