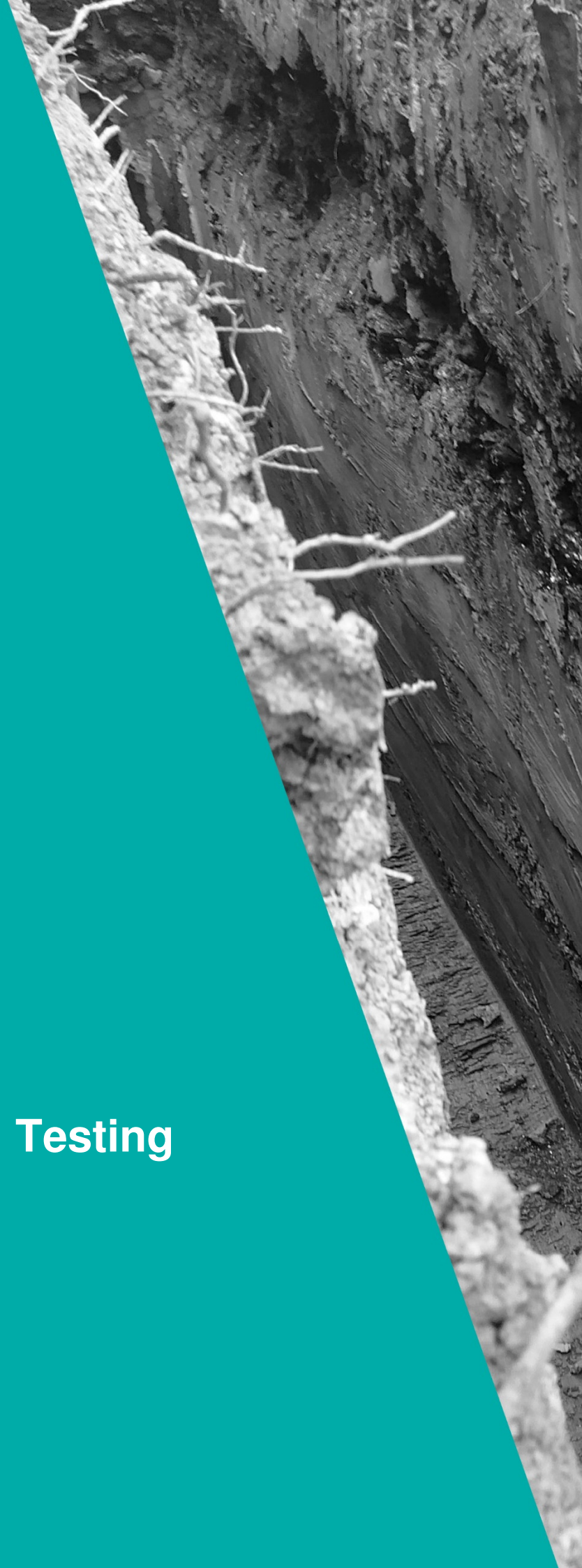
Eastwood
CONSULTING ENGINEERS



Report on Infiltration Testing

PENISTONE ROAD, BIRDSEDGE

YORKSHIRE LAND LIMITED

29 MARCH 2026

St Andrew's House
23 Kingfield Road
Sheffield, S11 9AS
mail@eastwoodce.com
0114 255 4554
eastwoodce.com

Sam Green
Yorkshire Land Ltd
Tattersall House,
East Parade,
Harrogate,
HG1 5LT

50175-ECE-XX-XX-RP-C-0001
AJK/JK

29 March 2026

Dear Sam,

Penistone Road, Birdsedge
Report on Infiltration Testing

We write to provide a summary of the infiltration testing for the above site on the instruction of Johnson Mowat Planning and Development Consultants, on behalf of Yorkshire Planning Limited. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

This summary is based on a review and interpretation of geological maps and memoirs, as well as the site works completed on the 16 March 2026.

The Site

The approximately 3.17-hectare site is located adjacent to Penistone Road, Birdsedge and is centred on 420330, 407860. The site currently comprises agricultural fields. The site boundaries comprise hedgerows, walls and adjacent fields. On the northwestern boundary a farm is present and on the southeastern boundary a row of houses is present. The site borders Penistone Road on the southwest boundary. Three large diameter water mains cross the site from the southern boundary towards the north.

A topographical survey provided to us indicates the site slopes down towards the north east, from approximately 270 m AOD on the south western boundary, to approximately 256 m AOD in the north of the site at a gradient of around 1 in 11.

Historical Ordnance Survey maps and aerial photography have been reviewed to assess the previous use of the site. The Envirocheck notes the site to comprise of agricultural land with no development from as early as 1892.

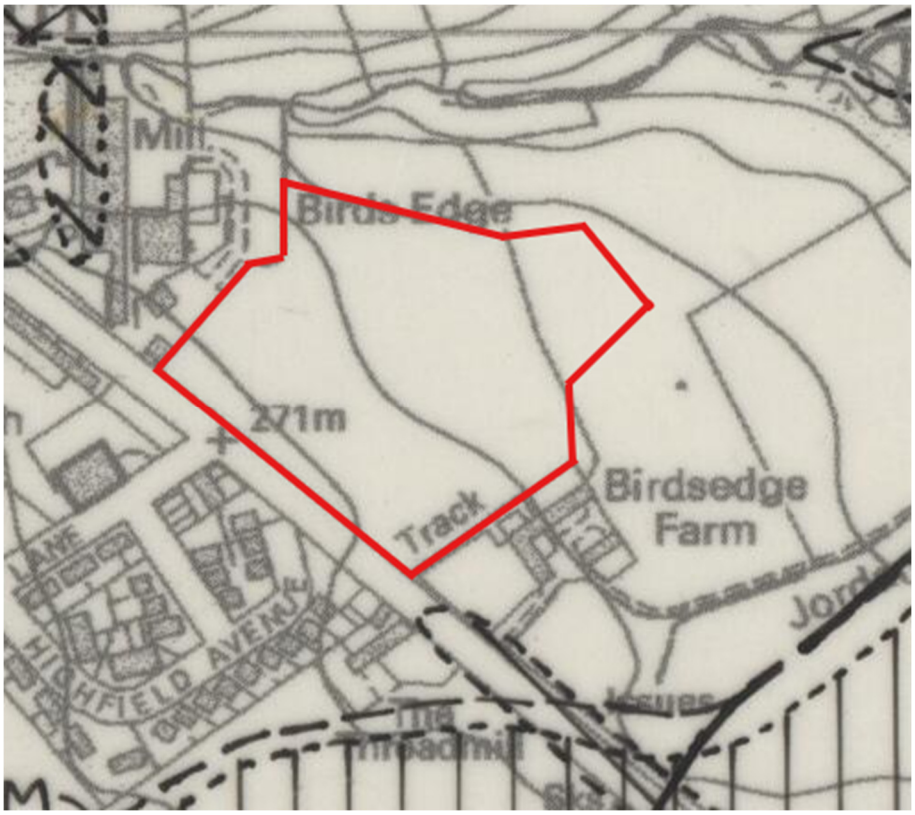
Geological Review

The geological maps for the area, Sheet SE20NW (1:10,000 scale), Yorkshire 273NW (1:10,560 scale) and the British Geological Survey (BGS) online viewer have been reviewed.

These maps indicate the solid geology below the site to comprise the Grenoside Sandstone, a named unit of the Pennine Lower Coal Measures Formation. The Grenoside Sandstone is a fine-grained, thinly bedded micaceous and carbonaceous sandstone.

There are no superficial deposits indicated to underlie the site and no faults are seen to cross the site.

The site investigation shown the strata to comprise topsoil of a dark brown clayey fine to coarse sand. Underlying this an extremely weak weathered sandstone bedrock recovered as a very gravelly fine to coarse sand was encountered. All three soakaway pits refused on sandstone bedrock from depths between 1.15 and 1.55 m below ground level (bgl).



Eastwood
CONSULTING ENGINEERS

Infiltration Testing

ECE visited the site on the 16 March 2026 and undertook 3 soakaway tests (SA01, SA02 and SA03) across the western field of site.

The ground conditions recorded on the site comprised topsoil at surface, consisting of a dark brown clayey fine to coarse grained sand. This was between 300 mm and 350 mm thick.

Below the topsoil, gravelly sand was present, where the gravel comprised sandstone. This transitioned in to weathered sandstone bedrock at depths of between 1.05 and 1.45 m below ground level.

The infiltration tests were undertaken in accordance with BR365, with water being placed in to the test pit from a bulk container. Where the water drained successfully, the test was repeated up to twice more. All three test pits encountered the weathered bedrock in the base of the pit.

The results of the infiltration testing are summarised below.

Location	Depth (m)	Test Number	Infiltration Rate ($x10^{-6}$ m/s)	
			BR365 Infiltration Rate	Average Infiltration Rate
SA01	1.50	1	110	89
		2	40	45
		3	39	47
SA02	1.10	1	Infiltration test not be completed.	2.8
SA03	1.30	1	Infiltration test not be completed.	2.2

Three repeat tests to BRE365 requirements were completed in SA01. Due to low infiltration rates, SA02 and SA03 did not drain to below 25% effective depth within three hours and therefore a BRE365 soil infiltration rate could not be calculated.

BRE365 infiltration rates of between 3.9 x 10^{-5} m/s and 11 x 10^{-5} m/s were recorded in SA01.

Eastwood
CONSULTING ENGINEERS

The infiltration rates recorded in SA01 suggest that soakaway drainage may locally be a viable form of surface water drainage. However, due to the much lower rates recorded in SA02 and SA03, it appears that infiltration drainage may not be possible in all areas of the site.

It is recommended that further testing is undertaken to determine which areas of the site can provide suitable infiltration rates, if the use of infiltration drainage is to be pursued. It may be prudent also to test the shallower, more weathered soils to see if shallow infiltration features such as swales or permeable paving could be considered.

Alternatively, a connection to the local sewer network or a watercourse would need to be agreed, if soakaway are not found to be viable.

Yours sincerely,

Andrew Kerslake

Technical Director

Enc: Trial Pit Logs and Location Plan (50175-ECE-XX-XX-DR-C-0001)
Infiltration Rate calculations

Copy: Mr J. Fisher – Johnson Mowat

Eastwood
CONSULTING ENGINEERS

TrialPit No
SA01
Sheet 1 of 1

Project Name	Project No.	Co-ords: 420349.00 - 407880.00	Date
Penistone Road, Birdsedge	50175	Level:	16/03/2026
Location: Penistone Road, Birdsedge		Dimensions: 2.10m / 0.80m / Depth: 1.50m	Scale 1:10
Client: Yorkshire Land Limited			Logged JK

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL. Grass over dark brown clayey fine to coarse SAND with frequent rootlets.
			0.30			Extremely weak yellowish brown weathered SANDSTONE bedrock. Recovered as a very gravelly fine to coarse SAND with frequent cobbles and boulders. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are subangular. Boulders are tabular.
			1.20			Extremely weak yellowish brown weathered SANDSTONE bedrock. Recovered as a yellow slightly gravelly SAND. Gravel is fine to coarse angular to subangular.
			1.45			Extremely weak SANDSTONE bedrock.
			1.50			Trialpit Complete at 1.500m

Remarks: Infiltration test terminated at 1.5 m due to refusal on sandstone bedrock. Groundwater not encountered.

Stability: Stable

Eastwood
CONSULTING ENGINEERS

TrialPit No
SA02
Sheet 1 of 1

Project Name	Project No.	Co-ords: 420342.00 - 407774.00	Date
Penistone Road, Birdsedge	50175	Level:	16/03/2026
Location: Penistone Road, Birdsedge		Dimensions: 2.10m, 0.80m, Depth: 1.10m	Scale 1:10
Client: Yorkshire Land Limited			Logged JK

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL. Grass over dark brown clayey fine to coarse SAND with frequent rootlets.
			0.35			Extremely weak yellowish brown weathered SANDSTONE bedrock. Recovered as a very gravelly fine to coarse SAND with frequent cobbles and boulders. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are subangular. Boulders are tabular.
			1.05			Extremely weak SANDSTONE bedrock.
			1.10			Trialpit Complete at 1.100m

Remarks: Infiltration test terminated at 1.1 m due to refusal on sandstone bedrock. Groundwater not encountered.

Stability: Stable

Eastwood
CONSULTING ENGINEERS

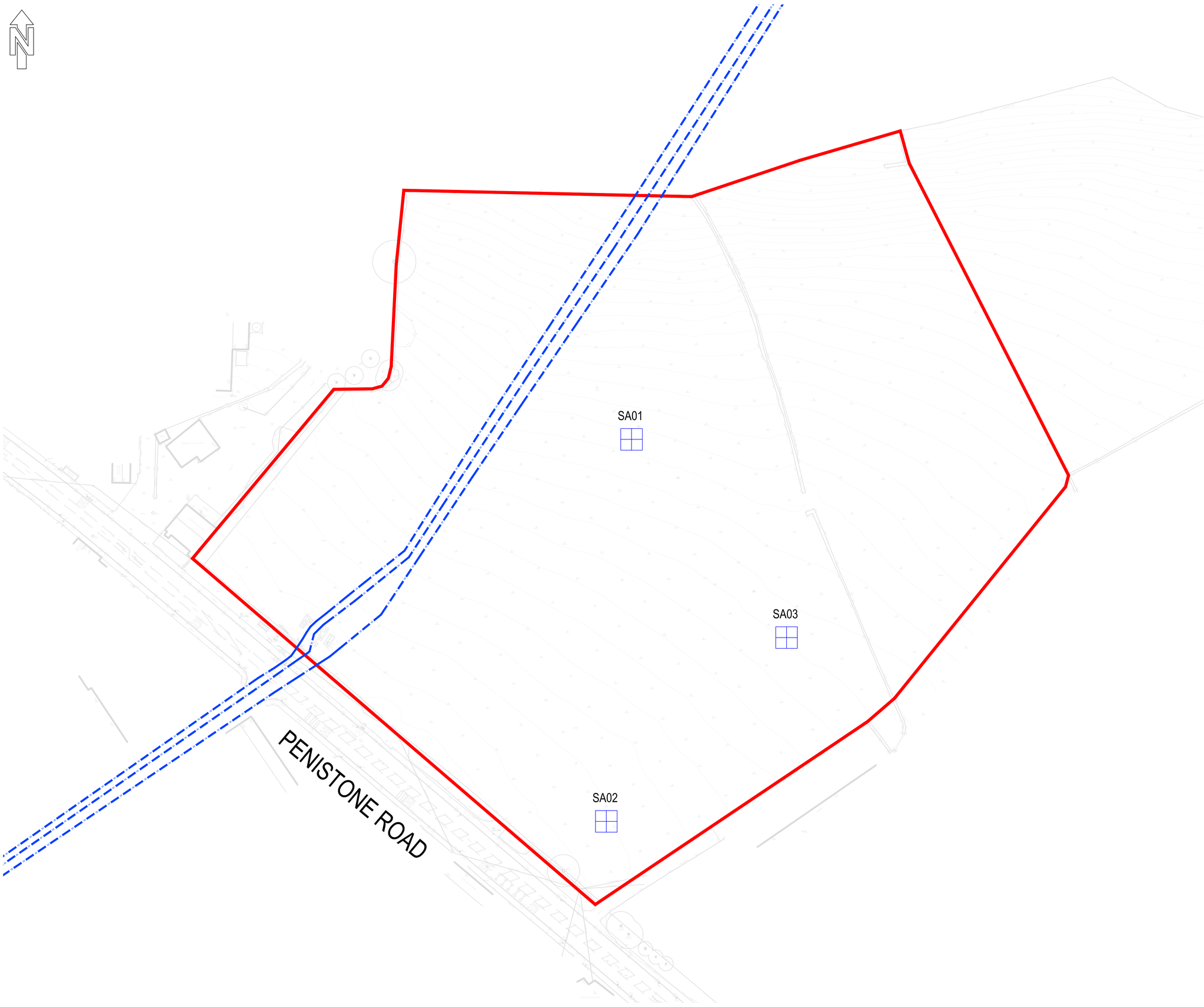
TrialPit No
SA03
Sheet 1 of 1

Project Name	Project No.	Co-ords: 420392.00 - 407825.00	Date
Penistone Road, Birdsedge	50175	Level:	16/03/2026
Location: Penistone Road, Birdsedge		Dimensions: 2.10m, 0.80m, Depth: 1.30m	Scale 1:10
Client: Yorkshire Land Limited			Logged JK

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL. Grass over dark brown clayey fine to coarse SAND with frequent rootlets.
			0.35			Extremely weak yellowish brown weathered SANDSTONE bedrock. Recovered as a very gravelly fine to coarse SAND with frequent cobbles and boulders. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are subangular. Boulders are tabular.
			1.25			Extremely weak SANDSTONE bedrock.
			1.30			Trialpit Complete at 1.300m

Remarks: Infiltration test terminated at 1.5 m due to refusal on sandstone bedrock. Groundwater not encountered.

Stability: Stable



1. This drawing is to be read in conjunction with all relevant Eastwood Consulting Engineers drawings prefixed 50175 and Architect's drawings.
2. The topographical survey is taken from 'MTSurveys', Topographical Survey, 'Land off A629, Birdsedge, HD8 8XS', dated January 2026.

KEY:

- Approximate position of soakaway test undertaken by ECE on 16.03.2026.
- Site boundary.
- Approximate location of water main according to yorkshire water services limited.

Exploratory Hole Coordinates

SA:	Easting:	Northing:
SA01	420349	407880
SA02	420342	407774
SA03	420392	407825

REV	DESCRIPTION	SIG	CHK	DATE
P01	First issue.	TGM	AK	07.04.2026

YORKSHIRE LAND LIMITED

PENISTONE ROAD, BIRDSLEDGE, HUDDERSFIELD

EXPLORATORY HOLE LOCATION PLAN

Eastwood
CONSULTING ENGINEERS
St Andrew's House
23 Kingfield Road
Sheffield, S11 9AS
T: 0114 255 4554
E: mail@eastwoodce.com
eastwoodce.com

ECE PROJECT No	SCALE AT A1	STATUS	SUITABLE FOR
50175	1:500m	S2	Information

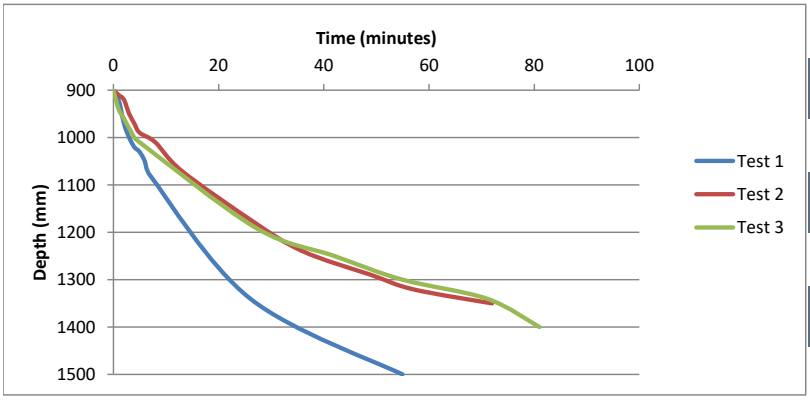
DRAWING NUMBER: 50175 - ECE - XX - XX - DR - C - 0001 (Project - Originator - Zone - Level - Type - Role - Number) REV: P01

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Penistone Road, Birdsedge
Client: Yorkshire Land Limited
Test Reference: SA01

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			2100	Trial pit length (mm)			2100	Trial pit length (mm)			2100
Trial pit width (mm)			800	Trial pit width (mm)			800	Trial pit width (mm)			800
Trial pit depth (mm)			1500	Trial pit depth (mm)			1500	Trial pit depth (mm)			1500
Plan area (m^2)			1.68	Plan area (m^2)			1.68	Plan area (m^2)			1.68
Time to discharge water (s)			120	Time to discharge water (s)			120	Time to discharge water (s)			120
Depth to water at start of test (mm)			900	Depth to water at start of test (mm)			900	Depth to water at start of test (mm)			900
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
16/03/2026	10:44	900	0	16/03/2026	11:43	900	0	16/03/2026	12:56	900	0
16/03/2026	10:45	920	1	16/03/2026	11:44	910	1	16/03/2026	12:57	940	1
16/03/2026	10:46	970	2	16/03/2026	11:45	920	2	16/03/2026	12:58	960	2
16/03/2026	10:47	1000	3	16/03/2026	11:46	950	3	16/03/2026	12:59	980	3
16/03/2026	10:48	1020	4	16/03/2026	11:47	970	4	16/03/2026	13:00	1000	4
16/03/2026	10:49	1030	5	16/03/2026	11:48	990	5	16/03/2026	13:01	1010	5
16/03/2026	10:50	1050	6	16/03/2026	11:51	1010	8	16/03/2026	13:23	1190	27
16/03/2026	10:51	1080	7	16/03/2026	11:56	1070	13	16/03/2026	13:38	1250	42
16/03/2026	11:10	1340	26	16/03/2026	12:10	1180	27	16/03/2026	13:51	1300	55
16/03/2026	11:39	1500	55	16/03/2026	12:19	1240	36	16/03/2026	14:07	1340	71
				16/03/2026	12:32	1290	49	16/03/2026	14:17	1400	81
				16/03/2026	12:40	1320	57				
				16/03/2026	12:55	1350	72				
Final depth		1500	55	Final depth		1350	72	Final depth		1400	81
75% Effective depth (mm)			1050	75% Effective depth (mm)			1050	75% Effective depth (mm)			1050
25% Effective depth (mm)			1350	25% Effective depth (mm)			1350	25% Effective depth (mm)			1350
Time at 75% effective depth - t_{p75} (min)			6	Time at 75% effective depth - t_{p75} (min)			11.33	Time at 75% effective depth - t_{p75} (min)			9.89
Time at 25 % effective depth - t_{p25} (min)			27.81	Time at 25 % effective depth - t_{p25} (min)			72	Time at 25 % effective depth - t_{p25} (min)			72.67
Effective Storage volume of water (m^3)			1.008	Effective Storage volume of water (m^3)			1.008	Effective Storage volume of water (m^3)			1.008
V_{p75-25} (m^3)			0.504	V_{p75-25} (m^3)			0.504	V_{p75-25} (m^3)			0.504
Internal surface area - a_{p50} (m^2)			3.42	Internal surface area - a_{p50} (m^2)			3.42	Internal surface area - a_{p50} (m^2)			3.42
t_{p75-25} (sec)			1308.6	t_{p75-25} (sec)			3640.2	t_{p75-25} (sec)			3766.8
BR365 Soil Infiltration Rate			**1.1E-04**	**BR365 Soil Infiltration Rate (f)**			**4.0E-05**	**BR365 Soil Infiltration Rate (f)**			**3.9E-05**
Average Soil Infiltration Rate			**8.9E-05**	**Average Soil Infiltration Rate**			**4.5E-05**	**Average Soil Infiltration Rate**			**4.7E-05**



Testing completed by	JK
Date	16.03.26

Calculation completed by	JK
Date	17.03.26

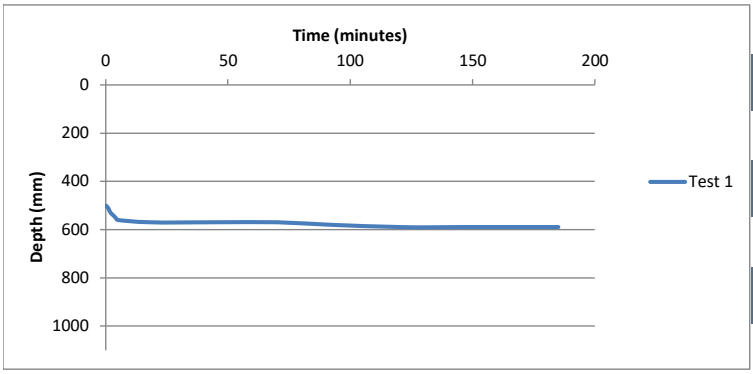
Calculation checked by	AJK
Date	27.03.26

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Penistone Road, Birdsedge
Client: Yorkshire Land Limited
Test Reference: SA02

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			2400	Trial pit length (mm)				Trial pit length (mm)			
Trial pit width (mm)			800	Trial pit width (mm)				Trial pit width (mm)			
Trial pit depth (mm)			1100	Trial pit depth (mm)				Trial pit depth (mm)			
Plan area (m^2)			1.92	Plan area (m^2)				Plan area (m^2)			
Time to discharge water (s)			120	Time to discharge water (s)				Time to discharge water (s)			
Depth to water at start of test (mm)			500	Depth to water at start of test (mm)				Depth to water at start of test (mm)			
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
16/03/2026	11:03	500	0								
16/03/2026	11:04	510	1								
16/03/2026	11:05	530	2								
16/03/2026	11:06	540	3								
16/03/2026	11:07	550	4								
16/03/2026	11:08	560	5								
16/03/2026	11:21	570	18								
16/03/2026	11:48	570	45								
16/03/2026	12:13	570	70								
16/03/2026	12:35	580	92								
16/03/2026	13:03	590	120								
16/03/2026	13:30	590	147								
16/03/2026	13:43	590	160								
16/03/2026	13:54	590	171								
16/03/2026	14:08	590	185								
Final depth		590	185	Final depth				Final depth			
75% Effective depth (mm)			650	75% Effective depth (mm)				75% Effective depth (mm)			
25% Effective depth (mm)			950	25% Effective depth (mm)				25% Effective depth (mm)			
Time at 75% effective depth - t_{p75} (min)			N/A	Time at 75% effective depth - t_{p75} (min)				Time at 75% effective depth - t_{p75} (min)			
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)				Time at 25 % effective depth - t_{p25} (min)			
Effective Storage volume of water (m^3)			1.152	Effective Storage volume of water (m^3)				Effective Storage volume of water (m^3)			
V_{p75-25} (m^3)			0.576	V_{p75-25} (m^3)				V_{p75-25} (m^3)			
Internal surface area - a_{p50} (m^2)			3.84	Internal surface area - a_{p50} (m^2)				Internal surface area - a_{p50} (m^2)			
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)				t_{p75-25} (sec)			
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**			**#DIV/0!**	**BR365 Soil Infiltration Rate (f)**			**#DIV/0!**
Average Soil Infiltration Rate			**2.8E-06**	**Average Soil Infiltration Rate**			**#DIV/0!**	**Average Soil Infiltration Rate**			**#DIV/0!**



Testing completed by	JK
Date	16.03.26

Calculation completed by	JK
Date	17.03.26

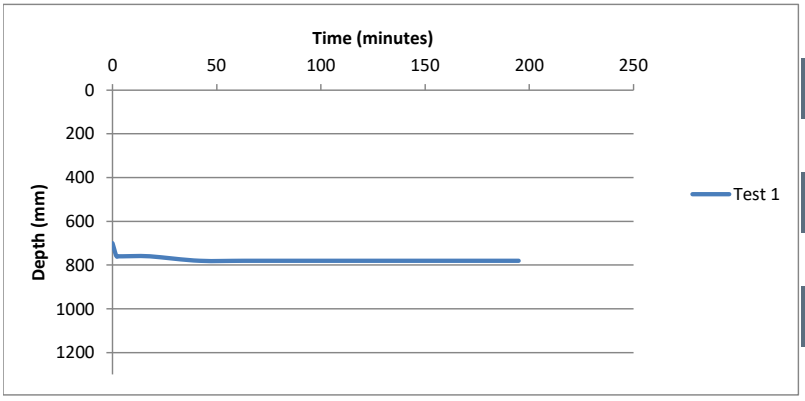
Calculation checked by	AJK
Date	27.03.26

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Penistone Road, Birdsedge
Client: Yorkshire Land Limited
Test Reference: SA03

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			2200	Trial pit length (mm)				Trial pit length (mm)			
Trial pit width (mm)			800	Trial pit width (mm)				Trial pit width (mm)			
Trial pit depth (mm)			1300	Trial pit depth (mm)				Trial pit depth (mm)			
Plan area (m^2)			1.76	Plan area (m^2)				Plan area (m^2)			
Time to discharge water (s)			700	Time to discharge water (s)				Time to discharge water (s)			
Depth to water at start of test (mm)			500	Depth to water at start of test (mm)				Depth to water at start of test (mm)			
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
16/03/2026	11:33	700	0								
16/03/2026	11:34	730	1								
16/03/2026	11:35	760	2								
16/03/2026	11:36	760	3								
16/03/2026	11:37	760	4								
16/03/2026	11:38	760	5								
16/03/2026	11:51	760	18								
16/03/2026	12:15	780	42								
16/03/2026	12:36	780	63								
16/03/2026	13:04	780	91								
16/03/2026	13:32	780	119								
16/03/2026	13:48	780	135								
16/03/2026	13:59	780	146								
16/03/2026	14:08	780	155								
16/03/2026	14:21	780	168								
16/03/2026	14:48	780	195								
Final depth		590	185	Final depth				Final depth			
75% Effective depth (mm)			700	75% Effective depth (mm)				75% Effective depth (mm)			
25% Effective depth (mm)			1100	25% Effective depth (mm)				25% Effective depth (mm)			
Time at 75% effective depth - t_{p75} (min)			N/A	Time at 75% effective depth - t_{p75} (min)				Time at 75% effective depth - t_{p75} (min)			
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)				Time at 25 % effective depth - t_{p25} (min)			
Effective Storage volume of water (m^3)			1.408	Effective Storage volume of water (m^3)				Effective Storage volume of water (m^3)			
V_{p75-25} (m^3)			0.704	V_{p75-25} (m^3)				V_{p75-25} (m^3)			
Internal surface area - a_{p50} (m^2)			4.16	Internal surface area - a_{p50} (m^2)				Internal surface area - a_{p50} (m^2)			
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)				t_{p75-25} (sec)			
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**			**#DIV/0!**	**BR365 Soil Infiltration Rate (f)**			**#DIV/0!**
Average Soil Infiltration Rate			**2.2E-06**	**Average Soil Infiltration Rate**			**#DIV/0!**	**Average Soil Infiltration Rate**			**#DIV/0!**



Testing completed by	JK
Date	16.03.26

Calculation completed by	JK
Date	17.03.26

Calculation checked by	AJK
Date	27.03.26

Eastwood

CONSULTING ENGINEERS

St Andrew's House
23 Kingfield Road
Sheffield, S11 9AS
mail@eastwoodce.com
0114 255 4554
eastwoodce.com