

Stephen Joines
Gleeson Homes
Manelli House, Cowper Road
Gilwilly Industrial Estate
Penrith, Cumbria,
CA11 9BN

Date: 23.06.2025

Project No: GEO2025-6753

Project: Jacktrees Road, Cleator Moor

Report Title: Supplementary Soakaway Investigation Report (V2)

Dear Stephen,

Geo Environmental Engineering Ltd (GEO) were commissioned by the Gleeson Regeneration Limited to carry out a series of supplementary soakaway tests on a site located off Jacktrees Road, Cleator Moor, Cumbria.

Previous works completed by others identified the presence of granular deposits which may be suitable for soakaways.

The following documents have been included as part of this report.

- Trial Pit Record Sheets (SA's 201 to 209).
- GEO Exploratory Hole Location Plan. This plan has overlain the previous investigation plan with the proposed development plan.

Originally, 3 no. locations were to be completed (SA's 01, 02 & 03) positioned to target areas previously identified as having granular deposits present.

As you will see from the attached trial pit logs, the majority of the soils encountered appeared to be cohesive with granular fractions included.

Therefore, instead of 3 no. soakaway pits, GEO completed a further six trial pits (9 no. trial pits in total) across the site to try and identify where the granular deposits were present. In total, 6 no. soakaways were completed (SA's 201, 205 to 209). Unfortunately, the granular deposits were not identified in large volumes with the majority of the deposits appearing to be cohesive in nature.

Of these soakaways, only one (SA209) completed in the lowest part of the site managed to soakaway to sufficient depth to be able to calculate a permeability classification (k) of 2.1×10^{-5} m/s which is indicative of "good drainage characteristics" and "medium permeability classification". The remaining soakaway tests either remained "static" or did not reach the required level in the time available to be able to calculate a permeability classification (k). Therefore, the tests completed in SA's 201 and 205 to 208 were classified as "fails".

Based on the supplementary fieldworks completed by GEO, it would appear that the ground conditions would not lend themselves to be utilised for potential soakaways given the cohesive nature of the drift deposits. The more granular content materials tend to be pockets or lenses within the cohesive deposits.

"Without Site Investigation Ground is a Hazard"

Site Investigation Steering Group (SISG), 1993

Therefore, it is unlikely that the site is suitable for soakaways and an alternative drainage solution will need to be identified.

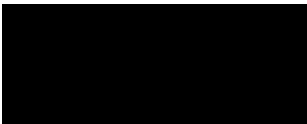
As always, consideration must be made for variations to occur in the ground conditions between the exploratory hole locations for which GEO holds no responsibility. It is therefore recommended that a “watching brief” be applied to ensure that if ground conditions vary from those identified during this investigation, then advice should be sought from a suitably qualified and experienced Geo-Environmental Engineer.

The recommendations and opinions expressed in this report are based on the ground conditions observed. Consequently, GEO takes no responsibility for conditions that have not been revealed or which occur between them.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval. Therefore, the report should be passed to the appropriate regulatory authorities and/ or other key stakeholders, including warranty providers in order to seek their approval of the findings prior to undertaking any site works or development on site.

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If there are any queries, please do not hesitate to contact Geo-Environmental Engineering Ltd.


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Andrew Hampson *BSc (Hons) FGS*
Associate - Geo Environmental Engineering Ltd


GEO2025-6753: Jacktrees Road, Cleator Moor – Site Location

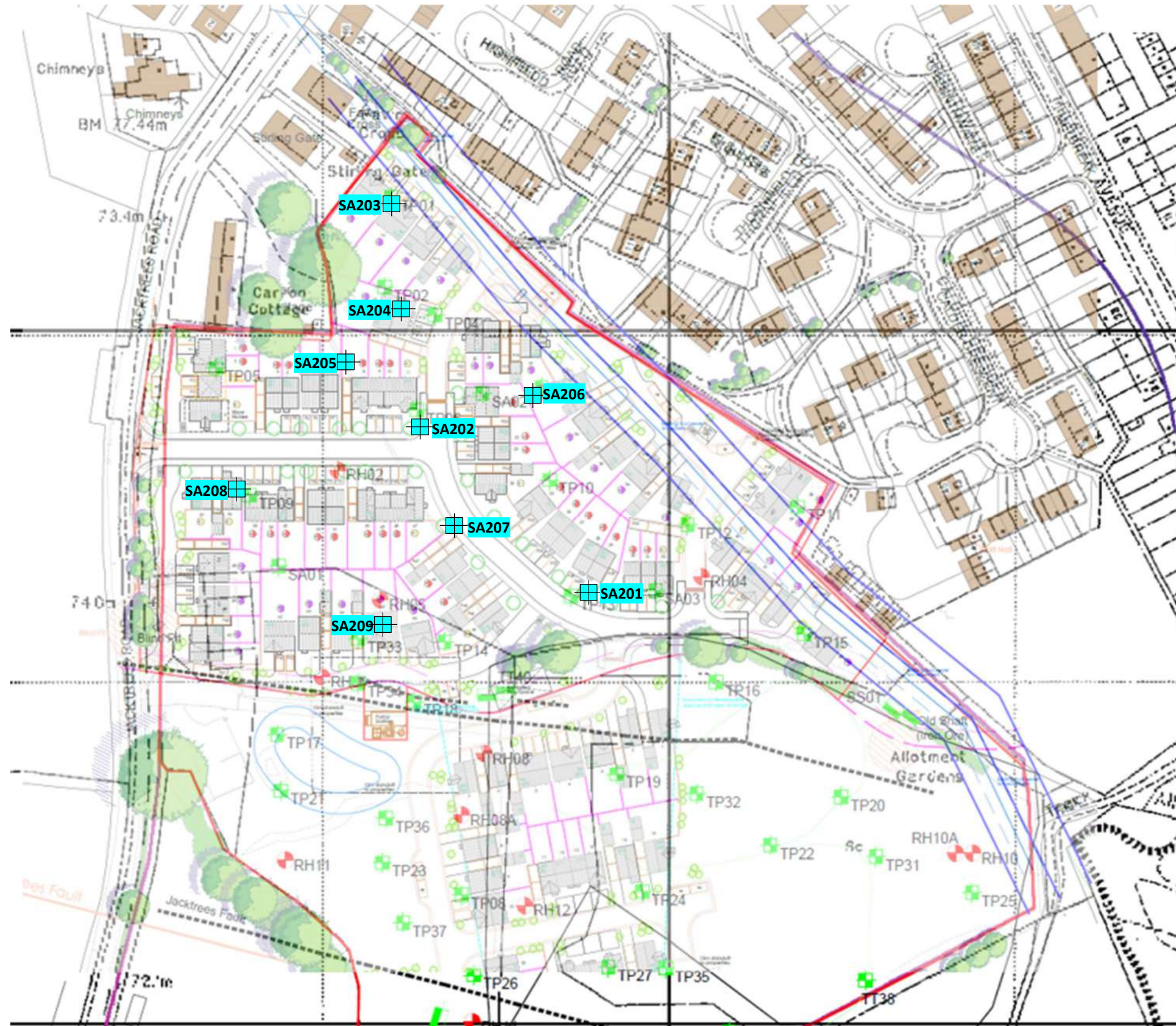


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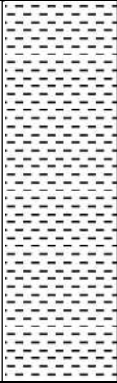
Telephone: 07883 440 186

GEO2025-6753– Jacktrees Road, Cleator Moor (Exploratory Hole Location Plan)



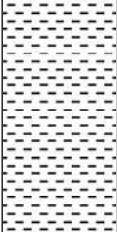
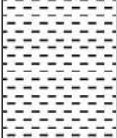
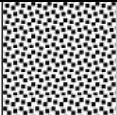
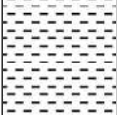
Key:
GEO Mechanically Excavated Trial Pits (April 2025)

GEO2025-6753: Jacktrees Road, Cleator Moor – SA201

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	TOPSOIL: Grass overlying dark brown sandy clay soil with occasional fine to coarse gravels and small pottery pieces.		
0.30	1.60	Stiff red brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles also noted.		
		End of trial pit at 1.60m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 4 hours, the water level dropped 330mm – FAIL. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 2.00m (L) x 0.70m (W) x 1.60m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301777 E 514526 N
Engineer: A. Hampson Site Works Date: 15/04/2025 Plant: Mechanical Excavator			Log Notes: B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	

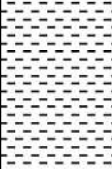
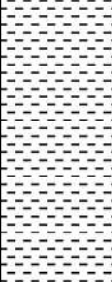


GEO2025-6753: Jacktrees Road, Cleator Moor – SA202

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.25	TOPSOIL: Grass overlying dark brown sandy clay soil with frequent fine to coarse gravels from 0.15m.		
0.25	1.15	Firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles also noted.		
1.15	1.60	Stiff red brown / brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone.		
1.60	2.00	“Damp” brown very clayey sandy GRAVEL. Gravel is fine to coarse sub angular to sub rounded sandstone and mudstone.		
2.00	2.40	Stiff red brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles also noted.		
		End of trial pit at 2.40m. Trial pit sides noted to be stable and dry. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 2.30m (L) x 0.60m (W) x 2.40m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301733 E 514577 N
Engineer: A. Hampson Site Works Date: 15/04/2025 Plant: Mechanical Excavator			Log Notes: B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	



GEO2025-6753: Jacktrees Road, Cleator Moor – SA203

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.45	TOPSOIL: Grass overlying dark brown sandy clay soil with frequent fine to coarse gravels from 0.15m. Occasional small cobbles, brick and clinker.		
0.45	1.00	Firm yellow brown sandy gravelly CLAY. Gravel is fine to coarse sub angular to sub rounded sandstone, mudstone and limestone.		
1.00	2.00	Firm occasionally stiff red brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone.		
		End of trial pit at 2.00m. Trial pit sides noted to be stable and dry. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.10m (L) x 0.65m (W) x 2.00m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301720 E 514638 N

Engineer: A. Hampson

Site Works Date: 15/04/2025

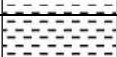
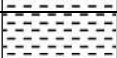
Plant: Mechanical Excavator

Log Notes:

B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



GEO2025-6753: Jacktrees Road, Cleator Moor – SA204

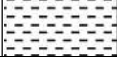
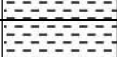
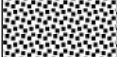
Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.15	TOPSOIL: Grass overlying dark brown sandy clay soil with occasional brick fragments and frequent coal gravel at 0.10m.		
0.15	0.25	MADE GROUND: Stiff dark grey / brown CLAY with frequent coal inclusions.		
0.25	0.45	MADE GROUND: Red fine to coarse angular GRAVEL. Possible red shale.		
0.45	0.75	MADE GROUND / POSSIBLY DISTURBED: Firm brown slightly sandy CLAY with occasional fine roots.		
0.75	1.10	Soft to firm light brown sandy gravelly CLAY. Gravel is fine to coarse sub angular to sub rounded sandstone, mudstone and limestone. Occasional small cobbles noted.		
1.10	1.25	Soft to firm orange brown slightly sandy CLAY.		
1.25	1.75	Stiff red brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles also noted.		
		End of trial pit at 1.75m. Trial pit sides noted to be stable and dry. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.10m (L) x 0.70m (W) x 1.75m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301731 E 514607 N

Engineer: A. Hampson
Site Works Date: 15/04/2025
Plant: Mechanical Excavator

Log Notes:
 B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



GEO2025-6753: Jacktrees Road, Cleator Moor – SA205

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	TOPSOIL: Grass overlying dark brown slightly sandy clay soil with occasional pottery fragments.		
0.20	0.35	Soft brown slightly sandy CLAY with occasional fine coal inclusions and fine roots.		
0.35	0.60	Firm light brown / yellow slightly gravelly sandy CLAY. Gravel is fine to coarse sub angular to sub rounded sandstone, mudstone and limestone.		
0.60	0.80	Stiff occasionally firm red brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles also noted.		
0.80	1.20	"Damp" red brown very clayey sandy GRAVEL. Gravel is fine to coarse sub angular to sub rounded sandstone and mudstone.		
1.30	1.50	Stiff red brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone.		
		End of trial pit at 1.50m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 4 hours, the water level remained static at 0.50m – FAIL. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.40m (L) x 0.62m (W) x 1.50m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301715 E 514598 N

Engineer: A. Hampson

Site Works Date: 15/04/2025

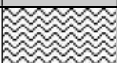
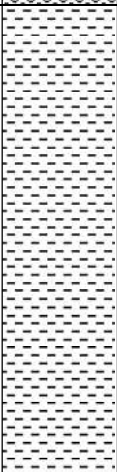
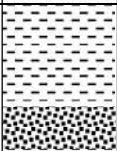
Plant: Mechanical Excavator

Log Notes:

B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



GEO2025-6753: Jacktrees Road, Cleator Moor – SA206

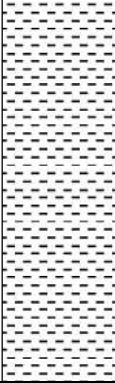
Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	TOPSOIL: Grass overlying dark brown slightly sandy clay soil.		
0.20	1.80	Soft to firm brown very sandy CLAY. At 1.10m, a field drain was encountered. Occasional fine to medium gravels noted from 1.40m.		
1.80	2.40	Stiff red brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Between 2.30m and 2.40m, noted to be very gravelly with a slight water ingress.		
2.40	2.45	Firm brown / dark grey silty CLAY.		
		End of trial pit at 2.45m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 4 hours, the water level dropped 100mm – FAIL. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.30m (L) x 0.67m (W) x 2.45m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301763 E 514596 N

Engineer: A. Hampson
Site Works Date: 15/04/2025
Plant: Mechanical Excavator

Log Notes:
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

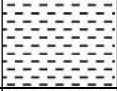
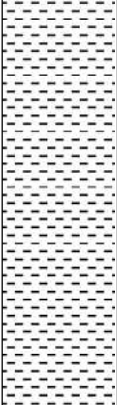


GEO2025-6753: Jacktrees Road, Cleator Moor – SA207

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	TOPSOIL: Grass overlying dark brown slightly sandy clay soil.		
0.30	1.60	Firm occasionally stiff red brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Occasional small cobbles and boulder noted. At 0.90m, noted to be very gravelly and occasionally soft.		
		End of trial pit at 1.60m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 3.5 hours, the water level dropped 70mm – FAIL. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.40m (L) x 0.61m (W) x 1.60m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301742 E 514537 N
Engineer: A. Hampson Site Works Date: 15/04/2025 Plant: Mechanical Excavator			Log Notes: B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	



GEO2025-6753: Jacktrees Road, Cleator Moor – SA208

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.35	TOPSOIL: Grass overlying dark brown slightly sandy clay soil.		
0.35	0.60	Firm orange brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone.		
0.60	2.00	Initially firm becoming stiff red brown red brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded mudstone, sandstone and limestone. Noted to be stiff at 1.70m.		
		End of trial pit at 2.00m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 3 hours, the water level remained static at 0.50m – FAIL. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.70m (L) x 0.64m (W) x 2.00m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301677 E 514554 N

Engineer: A. Hampson

Site Works Date: 15/04/2025

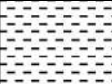
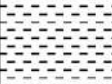
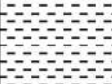
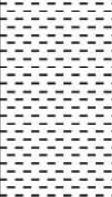
Plant: Mechanical Excavator

Log Notes:

B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



GEO2025-6753: Jacktrees Road, Cleator Moor – SA209

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.40	TOPSOIL: Grass overlying dark brown slightly sandy clay soil with occasional pottery, glass and ash.		
0.40	0.70	Firm orange brown / grey sandy CLAY.		
0.70	0.80	Firm light grey slightly sandy silty CLAY with fine to coarse subangular to subrounded mudstone, sandstone and limestone.		
0.80	1.00	Orange brown gravelly clayey fine to coarse SAND.		
1.00	1.65	Initially firm becoming stiff red brown very sandy very gravelly CLAY. Noted to be stiff at the base.		
		End of trial pit at 1.65m. Trial pit sides noted to be stable and dry. BRE365 Soakaway Test completed. Over 2 hours 48minutes, the water level dropped by 0.63m – permeability classification $k = 2.1 \times 10^{-5} \text{m/s}$ indicating “good drainage characteristics” and “medium permeability classification”. On completion, the base and sides were exposed with no significant bands of sand or gravel noted. Trial pit backfilled with arisings on completion.		Trial Pit Dimensions: 3.40m (L) x 0.64m (W) x 1.65m (D) Co-ordinates recorded by a GPS application (Alpine Quest). 301716 E 514522 N

Engineer: A. Hampson
Site Works Date: 15/04/2025
Plant: Mechanical Excavator

Log Notes:
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



IL INFILTRATION TEST CALCULATION SHEET

Jacktrees Road, Cleator Moor

2025-6753

15.04.2025

SA209

1

S: See Trial Pit Logs for Details

640	mm
3400	mm
1650	mm
630	mm

TS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	850
0	3	0	180	850
0	18	0	1080	850
0	38	0	2280	1050
0	39	0	2340	1060
0	47	0	2820	1130
1	0	0	3600	1180
1	8	0	4080	1250
1	15	0	4500	1270
1	23	0	4980	1300
1	30	0	5400	1330
1	45	0	6300	1360
1	54	0	6840	1390
2	0	0	7200	1400
2	11	0	2340	1400
2	14	0	8040	1420
2	24	0	8640	1430
2	32	0	9120	1450
2	48	0	10080	1480

RESULTS AND SOIL INFILTRATION ASSESSMENT

1

RATE ASSESSMENT:

een 75% and 25% effective depth:

0.68544 m³

t sides to 50% effective depth + base of pit):

4.7212 m²

between 75% and 25% effective depth:

6840 secs

2.1E-05 m/s