

APPENDIX 3

Exploratory Hole Logs

Borehole Logging Record :TPSA1



DRILLING DETAILS

Drilling Company: GeolInvestigations Ltd
Drilling Method: TP

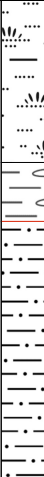
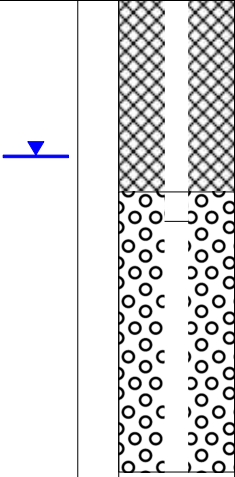
Drilling Date: 16th December 2024
Location: Main Street, Nailstone
Ground Elevation: (mAMS)

Drilled Depth: (mBGL)
Bore Diameter: (mm)
TOC Elevation: (mAGL)

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		Dark brown, organic, clayey, silty, SAND with rootlets and some fine to coarse gravel of rounded quartzite. (Sandy loam 'TOPSOIL').			
		0.50		Soft dark brown very sandy gravelly CLAY. Gravel is mainly medium to coarse rounded quartzite.			
		1.00		Soft red-brown, locally orangish brown mottled, sandy to very sandy CLAY with a little gravel of rounded quartzite. Becoming sandier below 1.05m. Below 1.40m: less sandy, more clayey.			
		1.50					
		2.00					
		2.50					
		3.00					
		3.50					
		4.00					
		4.50					

Groundwater Observations:

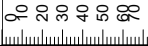
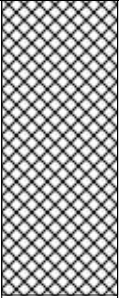
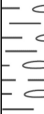
Steady groundwater seepages observed at 1.00m. 20mm single sized gravel backfill to 0.65m with 75mm slotted pipe to base. Backfilled with arisings to surface. Pit dimensions 1.60m D x 1.20m L x 0.45m W.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :TPSA2					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: TP			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
		0.00		Soft mid to dark brown clayey, silty, SAND with some to much fine to coarse rounded quartzite, a little white vein quartz and shale fragments. (Sandy loam 'TOPSOIL').			
		0.50		Soft, wet, slightly lighter brown sandy, gravelly CLAY. (GLACIAL TILL).			
		1.00		Soft wet red-brown mottled light brown sandy CLAY with a little rounded quartzite gravel. Below 1.05m: becoming dark red and gravelly. Below 0.80m: With a little gravel and pockets of saturated sand. (GLACIAL TILL).			
		1.50					
		2.00					
		2.50					
		3.00					
		3.50					
		4.00					
		4.50					

Groundwater Observations:

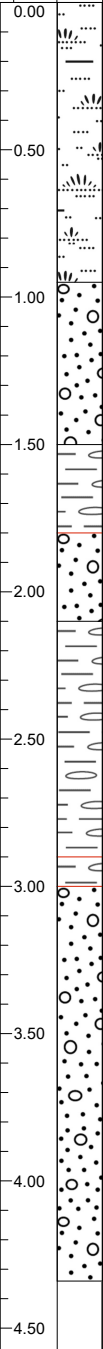
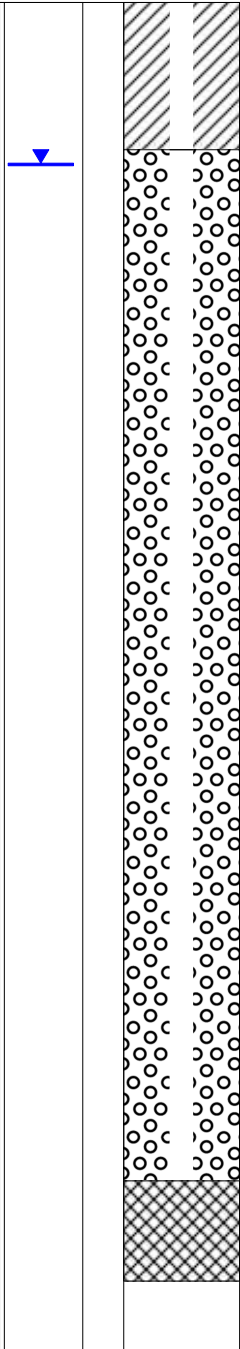
Steady to heavy groundwater inflows below 0.80m. 20mm single sized gravel backfill to 0.75m with 75mm slotted pipe to the base. Backfilled with arisings to surface. Pit 1.60m D x 1.30m L x 0.45m W.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :HDP1				GI GeolInvestigations		
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: HDP			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS�)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)			
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
ES1		0.00		Soft dark brown organic rich very clayey, very silty, fine SAND with rootlets and some to much fine to coarse gravel of rounded gravel of quartzite, occasional blocky subangular meta-sandstone, rounded vein quartz and rare flint/chert. (Sandy loam 'TOPSOIL').				
		0.50		Soft mid to light brown very silty, very sandy gravelly CLAY. Gravel is fine to coarse rounded quartzite and subangular meta-sandstone. (GLACIAL TILL),				
		1.00		Soft, wet, orange-brown, mottled orange, clayey to very clayey fine to medium SAND. (GLACIOFLUVIAL DEPOSIT).				
		1.50						
		2.00						
		2.50						
		3.00						
		3.50						
		4.00						
		4.50						
Groundwater Observations: Groundwater seepages at 0.80m, with ruuning sand conditions below.								

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :HDP2						
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: HDP			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMSL)			Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
ES2		0.00		Soft or loose dark brown very silty, very sandy, organic rich clay with many rootlets and some to much mainly medium to coarse rounded quartzite gravel with a little angular flint and rare medium to coarse gravel of red brick.				
		0.50		Soft orangish brown very sandy CLAY with occasional to some gravel of rounded quartzite, and angular whie rinded flints. (GLACIAL TILL).				
		1.00						
		1.50						
		2.00						
		2.50						
		3.00						
		3.50						
		4.00						
		4.50						
Groundwater Observations: Groundwater seepage at base, resulting in running sands on excavation below 0.85m.								

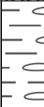
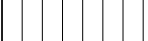
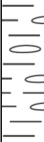
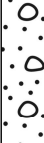
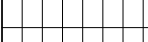
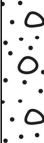
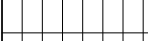
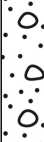
GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :HDP3				GI GeolInvestigations	
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: HDP			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
ES3		0.00		MG: Light brown 20mm roadstone chippings in a sandy matrix.			
			MG: Gravel and cobbles of concrete over gravel and cobble sized fragments of red brick and admixed fine to coarse black gravel of tar/bitumen bound macadam fragments.				
		0.50	Compact reddish brown clayey very sandy GRAVEL. Gravel is fine to coarse, mainly angular flints with some rounded quartzite, occasional bluish grey siltstone and ferruginous ironstone fragments. (GLACIOFLUCIAL DEPOSIT).				
		1.00					
		1.50					
		2.00					
2.50							
3.00							
3.50							
4.00							
4.50							

Groundwater Observations:
No groundwater observed.

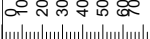
GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :WS1					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
B1		0.00		Soft dark brown silty, sandy to very sandy, organic rich CLAY with some (5%-10%) mainly medium to coarse subrounded to rounded variegated quartzites. Below 0.85m: becoming mottled orange-brown and with more coarser gravel. (TOPSOIL).		2,2,2,3,3,4 (12)	
		0.50					
		1.00		Medium dense red-brown slightly clayey, gravelly (20%), fine to medium SAND with a little coarse sand. Gravel is rounded quartzites and subangular to angular, yellowish off-white flint. Below 1.40m: very clayey. (GLACIOFLUVIAL DEPOSIT).	▲		
		1.50		Firm red-brown very sandy CLAY with occasional small pockets of gravel including rounded quartzite, subangular to subrounded dark orange ironstone, with yellow brown staining. Becoming stiff below 1.60m. (GLACIAL TILL).			
		2.00		Loose, borderline medium dense, red-brown, clayey, slightly gravelly SAND with dark brown mottling. (GLACIOFLUVIAL DEPOSIT).	▲		
D2		2.50	Firm slightly reddish, brown, silty CLAY with thin soft beds and a little gravel of subangular to subrounded quartzite, meta-sandstone and occasional flint. No recovery below 2.50m. (GLACIAL TILL).		3,3,1,2,2,2 (7)		
		3.00	Stiff reddish brown gravelly CLAY with black oxide patches and a little gravel of flint and chert. (GLACIAL TILL).	▲			
		3.50	Loose to borderline medium dense, saturated reddish brown clayey gravelly fine to medium, occasionally coarse, SAND with dark grey patches near base. Gravel is mainly medium to coarse rounded quartzite and subangular meta-sandstone. (GLACIOFLUVIAL DEPOSITS).		2,1,2,2,2,2 (8)		
		4.00		▲			
		4.50			1,0,1,1,3,2 (7)		

Groundwater Observations:

Borehole cased to 4.0m. Casing filled with water for SPTs to prevent blowing sands.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :WS2					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS			Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
D4 B3		0.00		MG: Slightly purplish grey sandy fine to medium angular gravel of roadstone chippings with a little medium to coarse red brick fragments.			
		0.50		MG: Soft dark grey clay with many fragments of fine to coarse gravel and a cobble of red brick.			
B4		1.00		Firm slightly orangish, mainly reddish, mottled orange-brown, very sandy, very gravelly CLAY. Gravel is of mixed lithologies including fine to medium, rarely coarse, mainly rounded quartzites, with some rounded to subrounded meta-sandstone, yellowish off-white angular flint and slaty angular blue-grey flat siltstone gravels. (GLACIAL TILL).		2,3,3,4,3,4 (14)	
		1.50		Loose to medium dense slightly reddish brown clayey SAND, with pockets of very sandy clay, and a little gravel (<5%) including rounded to subrounded quartzites and subangular slightly greenish grey and mid to light grey meta-sandstone. (GLACIOFLUVIAL DEPOSIT).			
B5		2.00		Soft red brown slightly sandy CLAY with a little to some gravel of quartzite pebbles and flint. (GLACIAL TILL).		3,6,3,2,2,2 (9)	
		2.50		Loose wet reddish brown clayey very sandy GRAVEL of mixed lithologies mainly fine to medium rarely coarse, rounded to subrounded quartzite, variegated meta-sandstone and occasional angular to subangular flint with some dark brown to black finely divided matter near base (possible ironstone fragments). (GLACIOFLUVIAL DEPOSIT).			
		3.00					
		3.50				3,2,2,1,2,1 (6)	
		4.00				2,1,2,1,1,2 (6)	
		4.50					
Groundwater Observations: Borehole cased to 4.0m. Casing filled with water for SPTs to prevent blowing sands.							

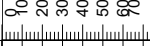
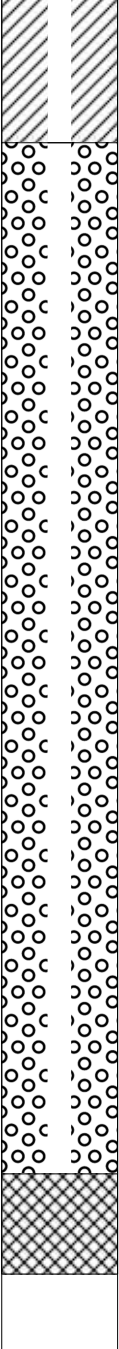
GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :WS3					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS		Drilling Date: 16th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)			

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
								
B6		0.00		MG: Black sandy gravel of tar/bitumen bound road planings/scalpings.				
				MG: Firm friable dark grey silty clay with a little to some gravel of quartzite and flint.				
B7		0.50		Firm orange-brown reddish brown, silty, very sandy, very gravelly, CLAY. Gravel is of mixed lithologies including mainly fine to medium rounded quartzite, angular to subangular flints, dark grey fine grained igneous rock, weak yellowish brown siltstone pockets. Possibly a very clayey gravel.(GLACIAL TILL).		2,3,4,4,4,6 (18)		
		1.00						
B8		1.50		Soft to firm red-brown fine to medium sandy CLAY with a little gravel of mainly rounded to subrounded quartzite.		2,4,4,3,3,2 (12)		
		2.00						
B8		2.50				2,3,2,2,2,2 (8)		
		3.00		Loose to medium dense, becoming loose mid to light brown slightly clayey silty very sandy GRAVEL of mainly rounded to subrounded quartzites, rare strong, subangular bluish greenish grey fine grained siltstone. (Gravelly SAND).				
B8		3.50				1,0,1,0,2,1 (3)		
		4.00						
B8		4.50						
								

Groundwater Observations:

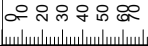
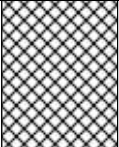
Borehole cased to 4.0m. Casing filled with water for SPTs to prevent blowing sands.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :WS4					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS			Drilling Date: 20th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		

Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
								
D1		0.00		MG: Black sandy gravel of tar/bitumen bound macadam fragments with some fine to medium, occasional coarse, gravel of grey concrete. MG: Soft mid to dark grey brown silty clay with some fine to coarse rounded quartzite gravel with occasional coarse red brick fragments.		2,2,3,3,3,5 (14)		
		0.50		Soft, soft to firm, slightly reddish brown very gravelly CLAY, and locally clayey gravel. Gravel is mainly medium to coarse including sub-angular bluish pale greenish siltstone, rounded quartzites and occasional yellowish off-white rinded angular flints. (GLACIAL TILL).				
		1.00		Soft, borderline soft to firm, orangish brown and reddish brown, very gravelly CLAY. Below 1.50m: grading to a very clayey gravel with yellowish brown pockets. Gravel is mainly medium to coarse angular flints with some rounded quartzite and a cobble of flint at the base. (GLACIAL TILL).				
		1.50						
		2.00		Soft, saturated, light brown, slightly reddish, very sandy and very gravelly CLAY. Gravel includes rounded quartzite, and medium to coarse angular to subangular flints. Small cobble of rounded quartzite at the base. (GLACIAL TILL).				
		2.50				23,3,2,3,3,3 (11)		
		3.00		Soft, slightly reddish, brown, slightly sandy, slightly gravelly CLAY. Gravel is fine to medium, occasionally coarse at 3.0m, angular to subangular flint, pale greenish grey siltstone and rounded quartzite. (GLACIAL TILL).		1,1,2,1,2,2 (7)		
		3.50		Firm becoming stiff below 3.40m, mid to dark red brown CLAY. (GLACIAL TILL).				
		4.00				3,2,4,4,5,6 (19)		
		4.50						

Groundwater Observations:

Borehole cased to 4.0m. Casing filled with water for SPTs to prevent blowing sands.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk			Borehole Logging Record :WS5					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS			Drilling Date: 20th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMSL)			Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
		0.00		MG: Soft friable dark brown silty clay fill with occasional red brick fragments, some fine roots throughout, and occasional yellow refractory brick fragments. Refusal at 0.5m on obstruction.				
		0.50						
		1.00						
		1.50						
		2.00						
		2.50						
		3.00						
		3.50						
		4.00						
		4.50						
Groundwater Observations: Refusal at 0.5m. Sampler bouncing on obstruction.								

Borehole Logging Record :WS5A



DRILLING DETAILS

Drilling Company: GeolInvestigations Ltd
Drilling Method: WS

Drilling Date: 20th December 2024

Location: Main Street, Nailstone

Ground Elevation: (mAMS)

Drilled Depth: (mBGL)

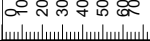
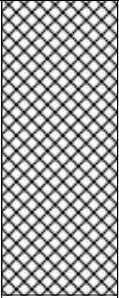
Bore Diameter: (mm)

TOC Elevation: (mAGL)

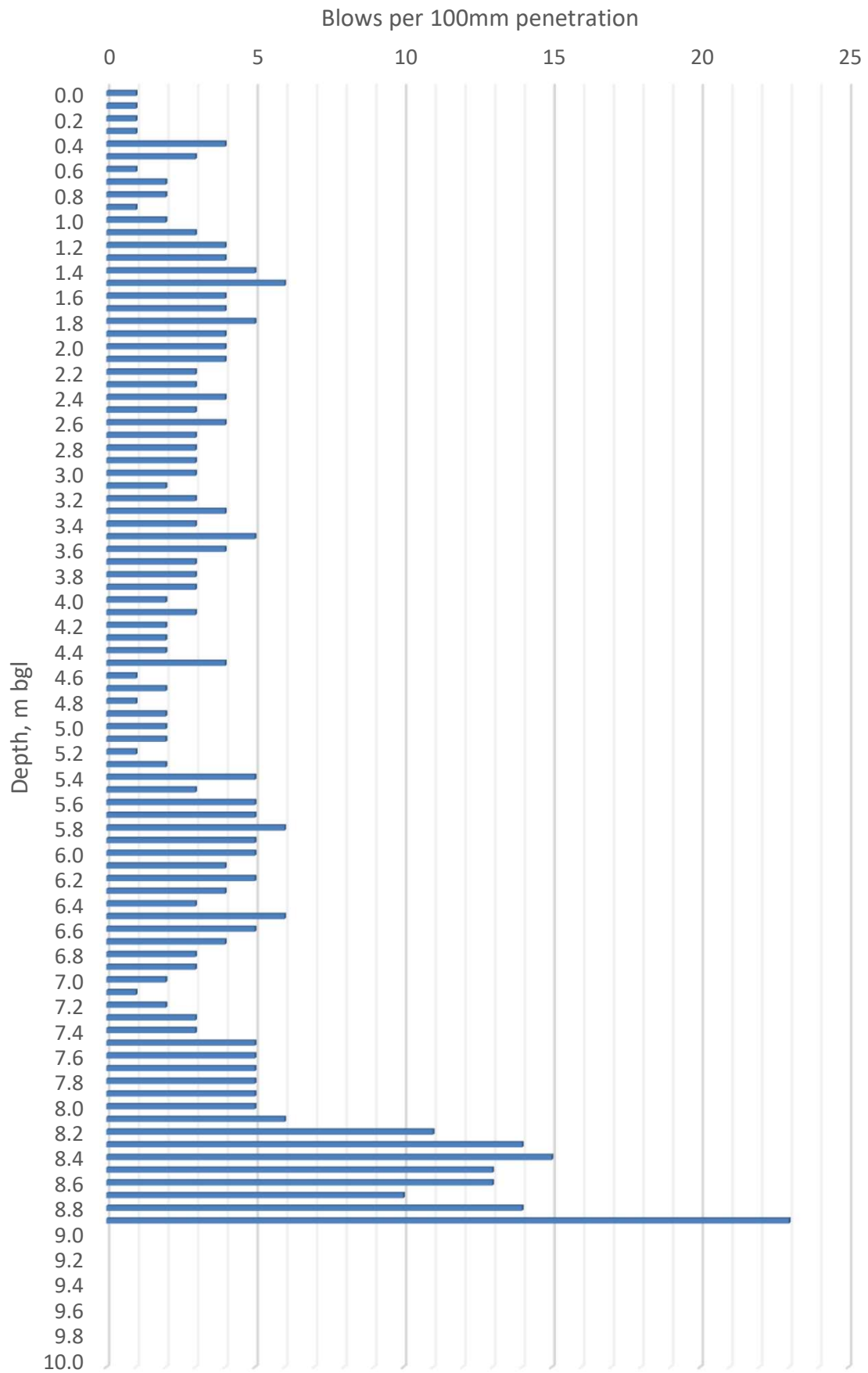
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels	
					0 10 20 30 40 50 60			
ES4		0.00		MG: Soft friable crumbly mid brown silty clay with occasional fine to medium gravel of rounded quartzite.				
		0.50						
D2		1.00		MG: Dark grey/black clayey silty fine to coarse sand, angular, tabular sandstone fragments with a little flint and rounded quartzite. Below 1.0m: with coarse gravel of concrete fragments.				
		1.50		Medium to coarse GRAVEL of rounded quartzite and subrounded to subangular flints in a brown sand matrix, becoming a slightly clayey fine to medium sand with a little fine gravel of quartzite. Below 1.50m: Becoming a mid to light brown coarse rounded quartzite. (GLACIOFLUVIAL DEPOSIT).				
		2.00		Firm and firm to stiff reddish brown very gravelly CLAY. Gravel includes weak yellowish brown sandstone pockets, angular to subangular yellowish off-white rinded flints and rounded to subrounded quartzites. Below 2.00m: Firm and less gravelly, with bands without gravel. (GLACIAL TILL).				
		2.50						
		3.00						
		3.50						
		4.00						
		4.50						

Groundwater Observations:

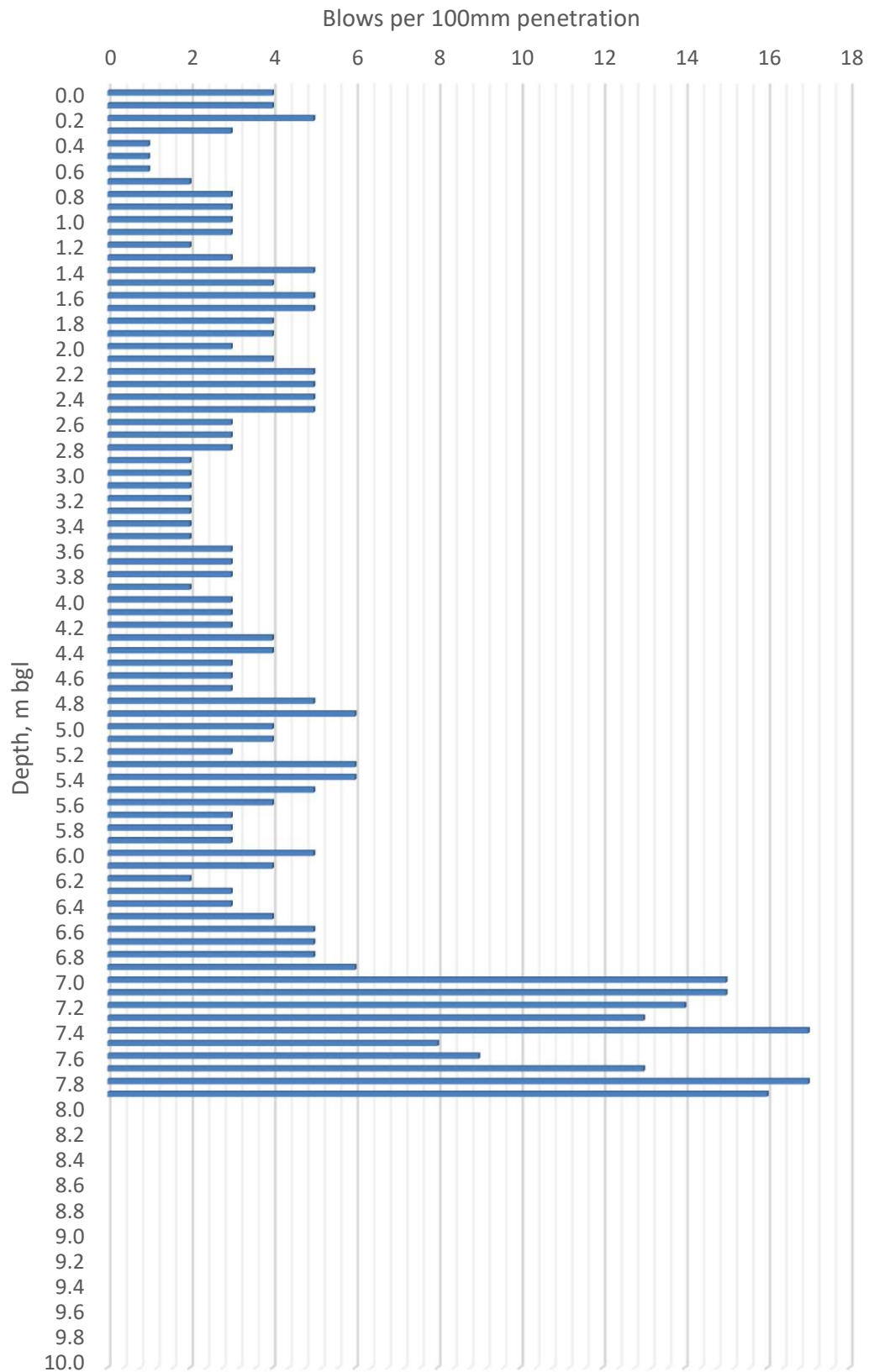
Borehole cased to 3.0m.

GeolInvestigations 9 Greenlands Business Centre Studley Road Redditch B98 7HD paul@geoinvestigations.co.uk		Borehole Logging Record :WS6					
DRILLING DETAILS Drilling Company: GeolInvestigations Ltd Drilling Method: WS			Drilling Date: 20th December 2024 Location: Main Street, Nailstone Ground Elevation: (mAMS)		Drilled Depth: (mBGL) Bore Diameter: (mm) TOC Elevation: (mAGL)		
Sample Reference	Sample Range	Depth (mBGL)	Graphic Log	Soil or Rock Field Material Description	SPT (blows/300mm)	In Situ/ Lab Test	Piezometer Construction Details And Groundwater Levels
ES5		0.00		MG: Soft, very slightly reddish brown organic rich clay with rootlets, black decayed root holes, and some fine to medium gravel, including quartzite, flints and fine red brick.			
		0.50		MG: Firm, friable, dark brown silty sandy clay with some fine to coarse gravel including red brick fragments, rounded quartzites, angular flints and rare to occasional fine black coal ash fragments.			
ES6		1.00		Soft dark grey silty clay with some fine gravel of coal ash near the top. No recovery below 0.80m.			
		1.50					
		2.00					
		2.50					
		3.00					
		3.50					
		4.00					
		4.50					
Groundwater Observations: Groundwater at 0.6m on backfilling.							

Main St, Nailstone, DPSH 1/WS3



Main St, Nailstone DPSH 2/WS2



Photographs of the exploratory holes are presented below.



Soakaway test pit TP SA1, after placement of groundwater monitoring standpipe and single sized gravel.



Excavation spoil from TP SA1.



Soakaway test pit TP SA2, showing localised instability due to groundwater ingress.



Soakaway trial pit TP SA2 after placement of groundwater monitoring standpipe and single sized gravel.



Excavation spoil from soakaway test pit TP SA2.



Hand dug pit HDP1.



Hand dug pit HDP1.



Hand dug pit HDP2.



Hand dug pit HDP2.



Hand dug pit HDP2.



Hand dug pit HDP2, showing made ground excavation arisings above the natural sandy gravel below.

Photographs of soil cores presented below (top left is ground level, bottom right is base of borehole).



Borehole WS1 soil cores.



Borehole WS2 soil cores, including close-up of typical very clayey, very sandy gravel encountered.



Borehole WS3 soil cores.



Borehole WS4 soil cores.



Borehole WS5 soil core to refusal at 0.50m begl.



Borehole WS5A soil cores near centre of the pond.



Borehole WS6 soil core to 1.0m begl.