

## Trial Pit Records



## Trial Pit Summary Table

Exploratory Hole Number	Excavation Method	Completion Depth (m BGL)	Remarks
TP SBC001	Machine excavated	2.20	Terminated due to encountering probable bedrock.
TP SBC002	Machine excavated	2.70	Terminated due to bedrock.
TP SBC003	Machine excavated	3.00	Advanced to required depth.
TP SBC004	Machine excavated	4.50	Advanced to required depth.
TP SBC005	Machine excavated	4.50	Advanced to required depth.
TP SBC006	Machine excavated	4.50	Advanced to required depth.
TP SBC007	Machine excavated	4.50	Advanced to required depth.
TP SBC008	Machine excavated	5.50	Advanced to required depth.
TP SBC009	Machine excavated	4.00	Terminated due to unsafe ground unsafe (slippery)
TP SBC010	Machine excavated	4.50	Advanced to required depth.
TP SBC011	Machine excavated	3.00	Advanced to required depth.
TP SBC012	Machine excavated	0.70	Terminated due to possible Roman ruins.
TP SBC012A	Machine excavated	4.50	Advanced to required depth.
TP SBC013	Machine excavated	4.50	Advanced to required depth.
TP SBC014	Machine excavated	3.00	Terminated due to repeated collapse.
TP SBC015	Machine excavated	6.00	Advanced to required depth.
TP SBC016	Machine excavated	4.50	Advanced to required depth.
TP SBC017	Machine excavated	5.80	Terminated due to slow progress.
TP SBC018	Machine excavated	4.50	Advanced to required depth.
TP SBC019	Machine excavated	4.50	Advanced to required depth.
TP SBC020	Machine excavated	4.30	Terminated due to high boulder content.
TP SBC021	Machine excavated	4.50	Advanced to required depth.
TP SBC022	Machine excavated	4.50	Advanced to required depth.
TP SBC023	Machine excavated	4.50	Advanced to required depth.
TP SBC024	Machine excavated	4.50	Advanced to required depth.
TP SBC025	Machine excavated	4.50	Advanced to required depth.
TP SBC026	Machine excavated	4.50	Advanced to required depth.
TP SBC027	Machine excavated	4.50	Advanced to required depth.
TP SBC028	Machine excavated	5.00	Terminated due to limit of excavator.
TP SBC029	Machine excavated	4.50	Advanced to required depth.
TP SBC030	Machine excavated	4.50	Advanced to required depth.
TP SBC031	Machine excavated	4.50	Advanced to required depth.
TP SBC032	Machine excavated	4.50	Advanced to required depth.
TP SBC033	Machine excavated	3.00	Advanced to required depth.
TP SBC034	Machine excavated	3.00	Advanced to required depth.
TP SBC035	Machine excavated	3.00	Advanced to required depth.
TP SBC036	Machine excavated	4.50	Advanced to required depth.
TP SBC038	Machine excavated	3.00	Advanced to required depth.
TP SBC039	Machine excavated	3.00	Advanced to required depth.
TP SBC040	Machine excavated	3.00	Advanced to required depth.
TP SBC041	Machine excavated	0.70	Terminated due to archaeologist.
TP SBC041A	Machine excavated	3.00	Advanced to required depth.
TP SBC042	Machine excavated	4.00	Terminated due to an obstruction.
TP SBC043	Machine excavated	5.70	Terminated due to limit of excavator.
TP SBC044	Machine excavated	6.00	Advanced to required depth.







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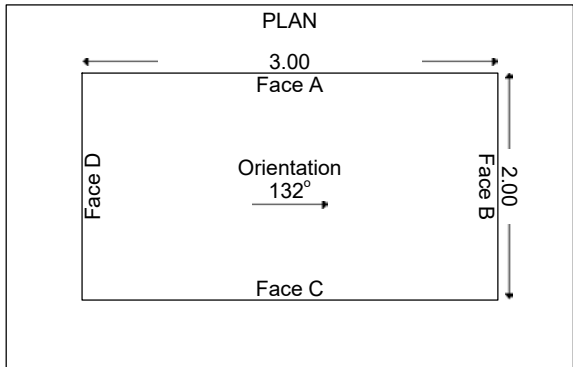
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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC001	
Client: AMEY OW Limited		Location: E:412317.138 N:510501.222	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 154.488	Start Date: 02/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description
0.10 0.20 0.20 0.50	J1 ES2 PID J3	<0.1ppm	Water	154.14		Grass over brown slightly sandy clayey/silty TOPSOIL with occasional rootlets. Soft orangish brown very sandy very gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to subrounded and include mudstone, limestone and sandstone. at c.1.00m BGL ... very clayey sandy gravel.
1.00 1.00 1.00	B4 ES5 PID	<0.1ppm		(1.85)		at c.1.50m BGL ... clay is of low plasticity.
1.50	J6					
2.00 2.10 2.10 2.10 2.10 2.20	B7 ES8 J9 B10 PID B11	<0.1ppm		152.29	2.20	at c.2.20m BGL ... strong yellow coarse grained SANDSTONE. <i>Terminated at 2.20m BGL - due to encountering probable bedrock.</i>



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) 3No. soakaway tests undertaken in the trial pit at 2.00m BGL.  
 (2) Unsuitable for HSV testing (not cohesive).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Che [redacted] by:	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412317.138 N:510501.222		TP SBC001
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 154.488	Start Date: 02/03/2021	Sheet: 2 of 4

Figure TP SBC001.1  
TP SBC001



Figure TP SBC001.2  
TP SBC001







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412317.138 N:510501.222		TP SBC001
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 154.488	Start Date: 02/03/2021	Sheet: 3 of 4

Figure TP SBC001.3  
TP SBC001



Figure TP SBC001.4  
TP SBC001







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC001</b>
Client: AMEY OW Limited	Location: E:412317.138 N:510501.222		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 154.488	Start Date: 02/03/2021	Sheet: 4 of 4

**Figure TP SBC001.5**  
**TP SBC001**





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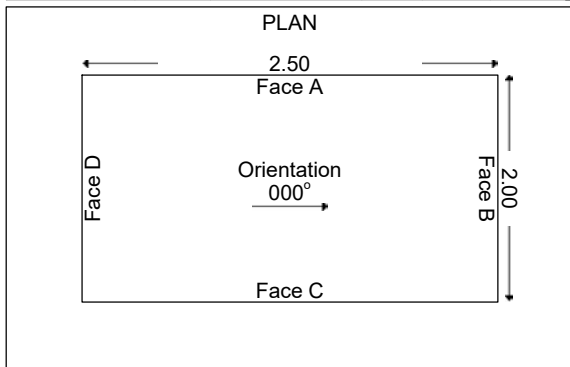
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC002	
Client: AMEY OW Limited		Location: E:412465.856 N:510499.211	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 163.116	Start Date: 26/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1			162.92		0.20	TOPSOIL.
0.20	ES2						Soft to firm light orange brown with orange staining slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone. Boulders are subangular and include limestone. at c.0.30m BGL ... clay is of low to intermediate plasticity.
0.20	PID	<0.1ppm					
0.30	J3						
0.50	B4						
0.50	HSV	51 (28)kPa					
1.00	ES5						
1.00	PID	<0.1ppm					
1.30	J6					(2.50)	
1.50	B7						
2.30	J8						at c.2.70m BGL ... light grey LIMESTONE (Bedrock). <i>Terminated at 2.70m BGL - due to bedrock.</i>
2.50	ES9			160.42		2.70	
2.50	PID	<0.1ppm					
2.70	B10						



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing below 0.50m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch	Logged by: R. Clarke	Contract No. 4322A
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC002	
Client: AMEY OW Limited	Location: E:412465.856 N:510499.211		Sheet: 2 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 163.116	Start Date: 26/02/2021	

Figure TP SBC002.1  
TP SBC002



Figure TP SBC002.2  
TP SBC002







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC002	
Client: AMEY OW Limited	Location: E:412465.856 N:510499.211		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 163.116	Start Date: 26/02/2021	Sheet: 3 of 5

Figure TP SBC002.3  
TP SBC002



Figure TP SBC002.4  
TP SBC002





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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC002	
Client: AMEY OW Limited	Location: E:412465.856 N:510499.211		Sheet: 4 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 163.116	Start Date: 26/02/2021	

Figure TP SBC002.5  
TP SBC002



Figure TP SBC002.6  
TP SBC002







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC002</b>
Client: AMEY OW Limited	Location: E:412465.856 N:510499.211		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 163.116	Start Date: 26/02/2021	Sheet: 5 of 5

**Figure TP SBC002.7  
TP SBC002**





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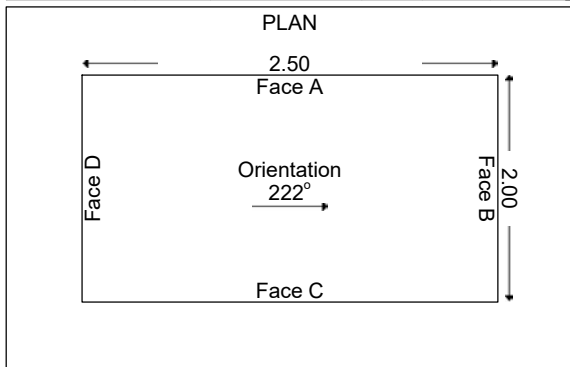
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC003</b>	
Client: AMEY OW Limited		Location: E:412552.318 N:510471.824	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 166.750	Start Date: 26/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1			166.50		0.25	TOPSOIL.
0.20	ES2					(0.55)	Soft light orange brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone. at c.0.35m BGL ... clay is of intermediate plasticity.
0.35	J3						
0.40	HSV	46 (24)kPa		165.95		0.80	
0.50	B4						
0.90	J5						Firm dark grey brown with orange staining slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone. Boulders are subangular to subrounded and include limestone and sandstone.
1.00	ES6	89 (34)kPa				(2.20)	
1.00	HSV						
1.50	B7						
1.90	J8						Complete at 3.00m BGL.
2.00	HSV	46 (28)kPa					
2.50	ES9						
2.50	B10						
2.90	J11			163.75		3.00	



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing below 2.00m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C [Redacted] :	Logged by: R. Clarke	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC003	
Client: AMEY OW Limited	Location: E:412552.318 N:510471.824		Sheet: 2 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.750	Start Date: 26/02/2021	

Figure TP SBC003.1  
TP SBC003



Figure TP SBC003.2  
TP SBC003







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412552.318 N:510471.824	TP SBC003	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.750	Start Date: 26/02/2021	Sheet: 3 of 5

Figure TP SBC003.3  
TP SBC003



Figure TP SBC003.4  
TP SBC003







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC003	
Client: AMEY OW Limited	Location: E:412552.318 N:510471.824		Sheet: 4 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.750	Start Date: 26/02/2021	

Figure TP SBC003.5  
TP SBC003



Figure TP SBC003.6  
TP SBC003







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412552.318 N:510471.824		TP SBC003
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.750	Start Date: 26/02/2021	Sheet: 5 of 5

Figure TP SBC003.7  
TP SBC003





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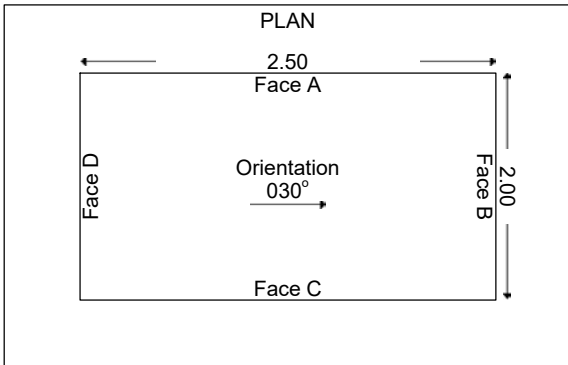
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:412707.061 N:510436.745	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 166.579	Start Date: 26/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.20	J1	120 (98)kPa				(0.50)	TOPSOIL.		
0.20	ES2			166.08		(0.50)	Firm to stiff light orange brown mottled grey with orange staining sandy slightly gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone.		
0.50	B3			165.58		(1.00)	Firm to stiff dark brown grey mottled grey slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone. Boulders are subangular to subrounded and include limestone. at c.1.60m BGL ... clay is of intermediate plasticity.		
0.50	HSV						(2.60)		
0.60	J4								
1.00	ES5								
1.10	J6								
1.50	B7								
1.60	J8								
2.50	ES9								
2.50	B10								
2.60	J11								
3.50	B12			162.98		3.60	Stiff to very stiff dark blue black slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and mudstone. Cobbles are subangular to subrounded and include sandstone, limestone and mudstone. Boulders are subangular to subrounded and include limestone.		
3.70	J13					(0.90)			
4.50	B14			162.08		4.50	Complete at 4.50m BGL.		
4.50	J15								



**GROUNDWATER**  
 Slight water seepage at 1.60m BGL. Water level at 4.45m BGL on completion.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing below 0.50m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: R. Clarke	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412707.061 N:510436.745		TP SBC004
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.579	Start Date: 26/02/2021	Sheet: 2 of 4

Figure TP SBC004.1  
TP SBC004



Figure TP SBC004.2  
TP SBC004





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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412707.061 N:510436.745		TP SBC004
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.579	Start Date: 26/02/2021	Sheet: 3 of 4

Figure TP SBC004.3  
TP SBC004



Figure TP SBC004.4  
TP SBC004







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412707.061 N:510436.745		TP SBC004
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.579	Start Date: 26/02/2021	Sheet: 4 of 4

Figure TP SBC004.5  
TP SBC004



Figure TP SBC004.6  
TP SBC004





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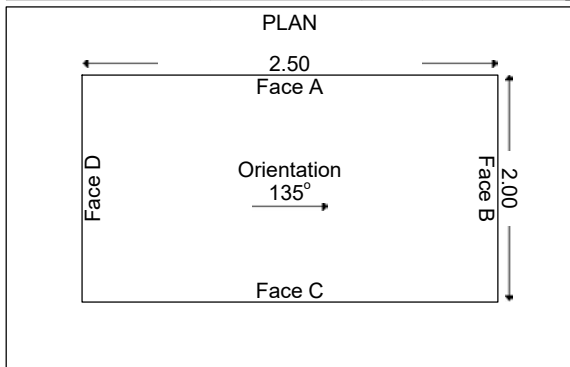
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC005	
Client: AMEY OW Limited		Location: E:412826.592 N:510285.610	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 169.561	Start Date: 25/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10 0.20	J1 ES2	57 (28)kPa	Water	169.26		0.30	Grass over brown clayey/silty TOPSOIL with occasional rootlets.	
0.50 0.50	J3 HSV				(1.10)	Soft grey mottled orangish brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are subangular to rounded and include limestone, mudstone and sandstone. at c.1.00m BGL ... slightly sandy slightly gravelly.		
1.00 1.00	B4 ES5				1.40	Firm blue mottled dark brown slightly sandy slightly gravelly CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone. Boulders are subrounded to rounded and include limestone and mudstone.		
1.50	J6				(3.10)	at c.3.50m BGL ... clay is of low plasticity.		
2.00	B7							
2.50 2.50	J8 ES9							
3.00	B10							
3.50	J11							
4.00	B12				165.06	4.50	Complete at 4.50m BGL.	
4.50	J13							



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: M. Bell	Contract No. 4322A
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412826.592 N:510285.610		TP SBC005
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 169.561	Start Date: 25/02/2021	Sheet: 2 of 4

Figure TP SBC005.1  
TP SBC005



Figure TP SBC005.2  
TP SBC005







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412826.592 N:510285.610	TP SBC005	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 169.561	Start Date: 25/02/2021	Sheet: 3 of 4

Figure TP SBC005.3  
TP SBC005



Figure TP SBC005.4  
TP SBC005





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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC005</b>
Client: AMEY OW Limited	Location: E:412826.592 N:510285.610		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 169.561	Start Date: 25/02/2021	Sheet: 4 of 4

**Figure TP SBC005.5  
TP SBC005**





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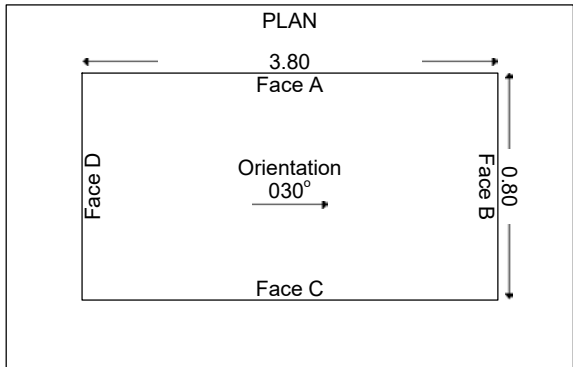
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC006</b>	
Client: AMEY OW Limited		Location: E:412925.368 N:510293.988	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 172.522	Start Date: 23/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1			172.22		0.30	TOPSOIL (Dark brown organic slightly peaty sandy slightly gravelly clay with low cobble content and many rootlets and roots. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include metamorphic lithologies).	
0.40	J2					(0.60)		
0.40-0.60	ES3 B4							
0.90	J5				171.62		0.90	Firm yellowish brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
1.00-1.20	B6							
1.20	ES7							
1.50	J8						(1.90)	Firm greyish brown and brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone, siltstone and limestone.
2.00-2.20	B9							
2.20	ES10							
2.40	J11							
2.60-2.80	B12							
2.90	J13						(1.40)	Stiff grey to bluish grey slightly sandy slightly gravelly CLAY with low to medium cobble content. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone, limestone and metamorphic lithologies.
3.00-3.20	B14							
4.20	J15				168.32		4.20	Firm grey slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine. Cobbles are subangular to subrounded and include sandstone, limestone and metamorphic lithologies.
4.30-4.50	B16				168.02		4.50	<i>Complete at 4.50m BGL.</i>



**GROUNDWATER**  
Water seepages between 1.00-2.80m BGL.

**STABILITY**  
Spalling from ground level to 2.80m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C [redacted]	Logged by: J. Beckett	Contract No. <b>4322A</b>
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412925.368 N:510293.988	TP SBC006	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 172.522	Start Date: 23/02/2021	Sheet: 2 of 4

Figure TP SBC006.1  
TP SBC006



Figure TP SBC006.2  
TP SBC006







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412925.368 N:510293.988		TP SBC006
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 172.522	Start Date: 23/02/2021	Sheet: 3 of 4

Figure TP SBC006.3  
TP SBC006



Figure TP SBC006.4  
TP SBC006







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:412925.368 N:510293.988		TP SBC006
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 172.522	Start Date: 23/02/2021	Sheet: 4 of 4

Figure TP SBC006.5  
TP SBC006



Figure TP SBC006.6  
TP SBC006





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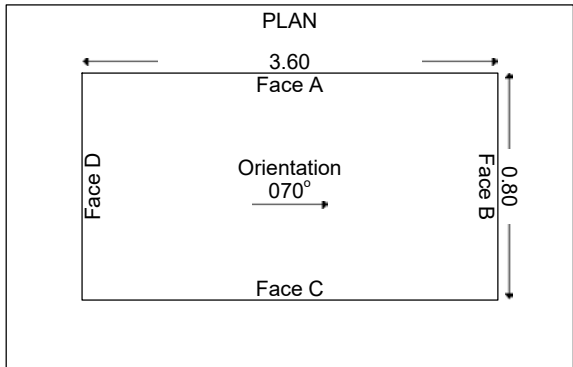
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC007</b>	
Client: AMEY OW Limited		Location: E:413166.269 N:510148.111	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 178.833	Start Date: 22/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10 0.20 0.40 0.40-0.60	J1 ES2 J3 B4	81 (26)kPa	Water	178.53	[Cross-hatched pattern]	0.30	MADE GROUND (Dark grey black slightly organic very sandy slightly gravelly clay. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone).		
1.00 1.00-1.20 1.00 1.20	J5 B6 HSV ES7			177.93	[Dotted pattern]	0.60	Firm brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone and sandstone. at c.0.40m BGL ... clay is of intermediate plasticity.		
1.70	J8			177.23	[Horizontal lines]	1.60	Firm grey mottled orange brown slightly sandy gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone and sandstone.		
2.00-2.20 2.20	B9 ES10				[Horizontal lines]	1.70	Stiff grey mottled brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone and sandstone.		
2.60	J11				[Horizontal lines]				
3.00-3.20	B12				[Horizontal lines]	175.53	3.30		
3.50 3.80-4.00	J13 B14				[Horizontal lines]		[X pattern]	1.20	Extremely weak thinly and thickly laminated grey MUDSTONE/SILTSTONE with iron staining. (Recovered as a slightly clayey gravel. Gravel is fine to coarse subangular to tabular).
4.50	J15				[Horizontal lines]	174.33		4.50	Complete at 4.50m BGL.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Beckett	Contract No. <b>4322A</b>
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413166.269 N:510148.111		TP SBC007
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 178.833	Start Date: 22/02/2021	Sheet: 2 of 4

Figure TP SBC007.1  
TP SBC007



Figure TP SBC007.2  
TP SBC007







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413166.269 N:510148.111		TP SBC007
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 178.833	Start Date: 22/02/2021	Sheet: 3 of 4

Figure TP SBC007.3  
TP SBC007



Figure TP SBC007.4  
TP SBC007







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413166.269 N:510148.111		TP SBC007
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 178.833	Start Date: 22/02/2021	Sheet: 4 of 4

Figure TP SBC007.5  
TP SBC007



Figure TP SBC007.6  
TP SBC007





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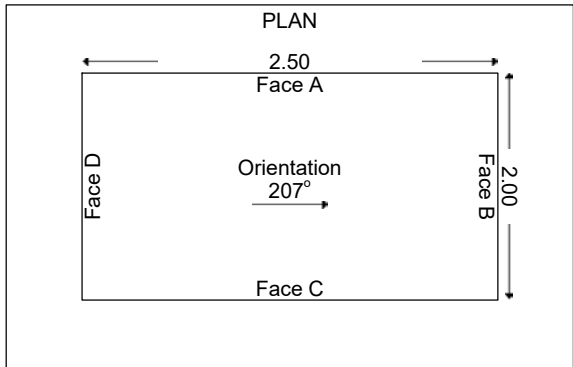
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC008</b>	
Client: AMEY OW Limited		Location: E:413350.337 N:510093.196	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 171.662	Start Date: 23/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10	J1	61 (31)kPa		171.56		0.10	Grass over brown slightly sandy clayey TOPSOIL with rootlets.		
0.20	ES2							Soft grey mottled orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone.	
0.50	J3							at c.0.50m BGL ... clay is of intermediate plasticity.	
0.50	HSV								
1.00	ES4								
1.00	B5								
1.30	J6					170.16		1.50	Soft orange mottled bluish brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are subangular to subrounded and include limestone, mudstone and sandstone.
1.60	J7								
2.00	B8					169.46		2.20	Bluish grey very clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone.
2.50	J9								
3.00	B10					168.46		3.20	at c.3.00m BGL ... slightly sandy slightly gravelly clay.
3.60	J11								
4.00	B12								
4.50	J13								
5.00	B14								
5.50	J15			166.16		5.50	Bluish grey clayey very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone. Cobbles are angular and include mudstone.		
							Complete at 5.50m BGL.		



**GROUNDWATER**  
Water in pit from soakaway test. Groundwater seepage at 3.00m BGL.

**STABILITY**  
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Soakaway test undertaken in the trial pit at 2.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C [Redacted]	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413350.337 N:510093.196		TP SBC008
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 171.662	Start Date: 23/02/2021	Sheet: 2 of 4

Figure TP SBC008.1  
TP SBC008



Figure TP SBC008.2  
TP SBC008







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413350.337 N:510093.196		TP SBC008
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 171.662	Start Date: 23/02/2021	Sheet: 3 of 4

Figure TP SBC008.3  
TP SBC008



Figure TP SBC008.4  
TP SBC008







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC008</b>
Client: AMEY OW Limited	Location: E:413350.337 N:510093.196		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 171.662	Start Date: 23/02/2021	Sheet: 4 of 4

**Figure TP SBC008.5  
TP SBC008**







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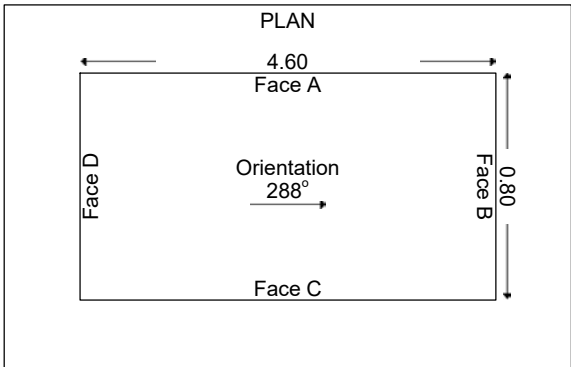
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC009</b>	
Client: AMEY OW Limited		Location: E:413434.860 N:509969.406	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 175.861	Start Date: 22/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10	J1	111 (65)kPa		175.56	[Cross-hatch pattern]	0.30	MADE GROUND (Topsoil comprising dark grey black slightly gravelly clayey sand with occasional roots. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, siltstone and mudstone).		
0.20	J2			174.96	[Dotted pattern]	(0.60)	Beige light brown very clayey/silty gravelly SAND with low cobble content. Sand is fine to medium. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone and sandstone.		
0.20	ES3								
0.40	J4								
0.40-0.60	B5								
1.00	J6								
1.00	HSV								
1.20	ES7								
1.20-1.40	B8								
1.60	J9								
2.00-2.20	B10								
2.20	ES11								
2.20	J12					173.46	[Horizontal line pattern]	2.40	Firm brownish grey and grey slightly sandy to sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone and sandstone. at c.1.60m BGL ... clay is of low plasticity.
2.80-3.00	B13							(1.00)	Firm brownish grey and grey slightly sandy to sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and siltstone. Cobbles are subangular to subrounded and include limestone and sandstone. at c.2.80m BGL ... clay is of low plasticity.
3.40	J14					172.46	[Horizontal line pattern]	3.40	Extremely weak thinly and thickly laminated grey MUDSTONE/SILTSTONE. (Recovered as gravel. Gravel is fine to coarse subangular to tabular).
3.60-3.80	B15							(0.60)	
4.00	J16			171.86	[X pattern]	4.00	Terminated at 4.00m BGL - unsafe ground (slippery).		



**GROUNDWATER**  
 Water strike at 3.60m - water level rose to 3.40m BGL (20mins). Water level at 3.96m BGL on completion.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC009</b>
Client: AMEY OW Limited	Location: E:413434.860 N:509969.406		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.861	Start Date: 22/02/2021	Sheet: 2 of 4

**Figure TP SBC009.1  
TP SBC009**



**Figure TP SBC009.2  
TP SBC009**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413434.860 N:509969.406		TP SBC009
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.861	Start Date: 22/02/2021	Sheet: 3 of 4

Figure TP SBC009.3  
TP SBC009



Figure TP SBC009.4  
TP SBC009







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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413434.860 N:509969.406		TP SBC009
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.861	Start Date: 22/02/2021	Sheet: 4 of 4

Figure TP SBC009.5  
TP SBC009







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

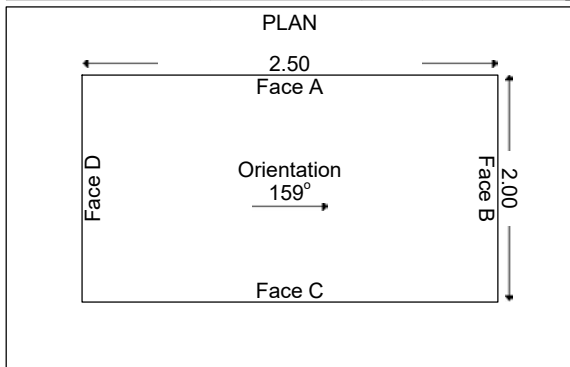
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC010</b>	
Client: AMEY OW Limited		Location: E:413636.770 N:509858.647	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 175.046	Start Date: 23/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10	J1	67 (33)kPa	Water	174.80		0.25	Grass over brown slightly sandy clayey TOPSOIL with many rootlets.		
0.20	ES2			174.45		0.60	Soft grey mottled orangish brown very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone.		
0.50	J3			(1.20)	Water	173.25	(1.20)	1.80	Orange mottled dark brown very clayey very gravelly SAND with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles and boulders are angular to rounded and include limestone, mudstone and sandstone. Boulders are rounded and includes limestone.
0.50	HSV								
0.60	B4			(1.20)	Water	172.05	(1.20)	3.00	Firm bluish black slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone.
1.00	ES5								
1.00	B6			(1.50)	Water	170.55	(1.50)	4.50	Stiff bluish grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone. Cobbles are angular and include mudstone.
1.50	J7								
2.00	B8			(1.50)	Water	170.55	(1.50)	4.50	Complete at 4.50m BGL.
2.50	J9								
2.50	ES10			(1.50)	Water	170.55	(1.50)	4.50	Complete at 4.50m BGL.
3.00	B11								
3.50	J12			(1.50)	Water	170.55	(1.50)	4.50	Complete at 4.50m BGL.
4.00	B13								
4.50	J14	(1.50)	Water	170.55	(1.50)	4.50	Complete at 4.50m BGL.		



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: M. Bell	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413636.770 N:509858.647		TP SBC010
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.046	Start Date: 23/02/2021	Sheet: 2 of 4

Figure TP SBC010.1  
TP SBC010



Figure TP SBC010.2  
TP SBC010







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413636.770 N:509858.647		TP SBC010
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.046	Start Date: 23/02/2021	Sheet: 3 of 4

Figure TP SBC010.3  
TP SBC010



Figure TP SBC010.4  
TP SBC010







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC010</b>
Client: AMEY OW Limited	Location: E:413636.770 N:509858.647		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 175.046	Start Date: 23/02/2021	Sheet: 4 of 4

**Figure TP SBC010.5**  
**TP SBC010**







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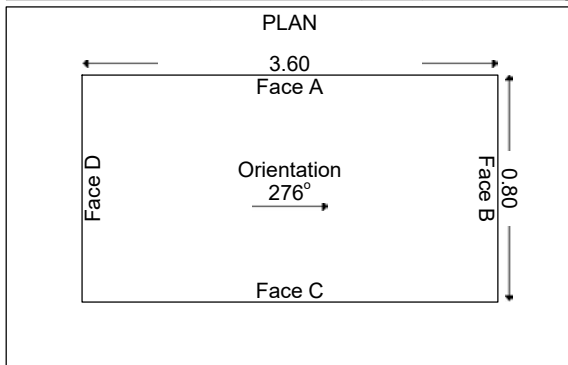
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC011</b>	
Client: AMEY OW Limited		Location: E:413841.152 N:509719.555	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 170.325	Start Date: 23/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1	53 (17)kPa		170.13		0.20	TOPSOIL (Brown organic silty sandy slightly gravelly clay with low cobble content and many rootlets. Gravel is fine to coarse angular to subrounded and includes sandstone and mudstone).	
0.30	J2					(0.80)	Firm yellowish brown to brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone, granite and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.	
0.30	ES3							
0.40-0.60	B4							
0.50	HSV			169.33		1.00	Firm grey mottled brown and brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.	
1.10	J5	64 (21)kPa				(1.30)	Firm and stiff grey slightly sandy slightly gravelly CLAY with high cobble content. Gravel is fine to coarse subangular to subrounded and includes mudstone, sandstone and metamorphic lithologies. Cobbles are subangular to subrounded and include limestone.	
1.20	ES6							
1.20-1.40	B7							
1.50	HSV			168.03		2.30	at c.2.40m BGL ... clay is of low plasticity.	
2.00	ES8					(0.70)		
2.00-2.20	B9							
2.40	J10			167.33		3.00	<i>Complete at 3.00m BGL.</i>	
2.80-3.00	B11							
3.00	ES12							



**GROUNDWATER**  
 Pit sides and base stable throughout excavation.

**STABILITY**  
 No groundwater inflow observed.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. 4322A
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413841.152 N:509719.555		TP SBC011
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 170.325	Start Date: 23/02/2021	Sheet: 2 of 5

Figure TP SBC011.1  
TP SBC011



Figure TP SBC011.2  
TP SBC011







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC011	
Client: AMEY OW Limited	Location: E:413841.152 N:509719.555		Sheet: 3 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 170.325	Start Date: 23/02/2021	

Figure TP SBC011.3  
TP SBC011



Figure TP SBC011.4  
TP SBC011







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC011</b>
Client: AMEY OW Limited	Location: E:413841.152 N:509719.555		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 170.325	Start Date: 23/02/2021	Sheet: 4 of 5

Figure TP SBC011.5  
TP SBC011



Figure TP SBC011.6  
TP SBC011







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413841.152 N:509719.555		TP SBC011
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 170.325	Start Date: 23/02/2021	Sheet: 5 of 5

Figure TP SBC011.7  
TP SBC011







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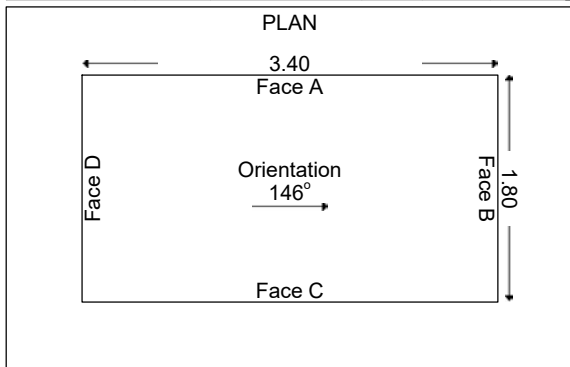
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC012	
Client: AMEY OW Limited		Location: E:414022.392 N:509645.280	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 167.986	Start Date: 23/02/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1	69 (29)kPa		167.69		0.30	TOPSOIL (Firm brown to greyish brown sandy slightly gravelly clay with many rootlets. Sand is fine. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone).
0.40	J2			(0.40)		0.70	Firm yellow brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies. Terminated at 0.70m BGL - due to possible Roman ruins.
0.40	ES3			167.29			
0.40	B4						
0.50	HSV						



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. 4322A
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC012</b>
Client: AMEY OW Limited	Location: E:414022.392 N:509645.280		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 167.986	Start Date: 23/02/2021	Sheet: 2 of 3

**Figure TP SBC012.1  
TP SBC012**



**Figure TP SBC012.2  
TP SBC012**







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC012</b>
Client: AMEY OW Limited	Location: E:414022.392 N:509645.280		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 167.986	Start Date: 23/02/2021	Sheet: 3 of 3

**Figure TP SBC012.3**  
**TP SBC012**







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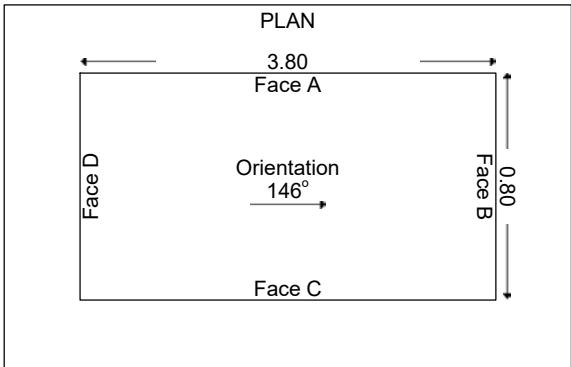
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC012A	
Client: AMEY OW Limited		Location: E:414022.727 N:509643.045	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 167.797	Start Date: 24/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.60	HSV	54 (17)kPa		167.50		0.30	TOPSOIL (Dark greyish brown slightly sandy slightly gravelly slightly peaty organic clay with many rootlets. Sand is fine. Gravel is fine to medium angular to subangular and includes sandstone).	
1.00-1.20	J1 B2 ES3			166.80		(0.70)	Firm yellow brown mottled grey slightly sandy slightly gravelly CLAY Gravel is fine to coarse angular to subangular and includes sandstone and mudstone.	
1.50	J4			166.10		(0.70)	Firm brown mottled grey sandy slightly gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse subangular to subrounded and includes mudstone and sandstone. Cobbles are subangular and include sandstone.	
1.80	J5			165.00		(1.10)	Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular to subangular and includes mudstone and siltstone.	
2.00-2.20	B6						Stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies. at c.2.90m BGL ... clay is of low plasticity.	
2.20	ES7			163.30		(1.70)		
2.50	J8						Complete at 4.50m BGL.	
2.90	J9							
3.00-3.20	B10							
3.20	ES11							
3.50	J12							
4.00-4.20	B13 HSV	84 (39)kPa						
4.00	ES14							
4.20								
4.50	B15							



**GROUNDWATER**  
 Water seepages between 2.50-2.80m BGL.

**STABILITY**  
 Some Spalling between 1.70-2.80m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Beckett	Contract No. 4322A
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414022.727 N:509643.045	TP SBC012A	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 167.797	Start Date: 24/02/2021	Sheet: 2 of 4

Figure TP SBC012A.1  
TP SBC012A



Figure TP SBC012A.2  
TP SBC012A







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414022.727 N:509643.045		TP SBC012A
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 167.797	Start Date: 24/02/2021	Sheet: 3 of 4

Figure TP SBC012A.3  
TP SBC012A



Figure TP SBC012A.4  
TP SBC012A







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC012A</b>
Client: AMEY OW Limited	Location: E:414022.727 N:509643.045		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 167.797	Start Date: 24/02/2021	Sheet: 4 of 4

Figure TP SBC012A.5  
TP SBC012A







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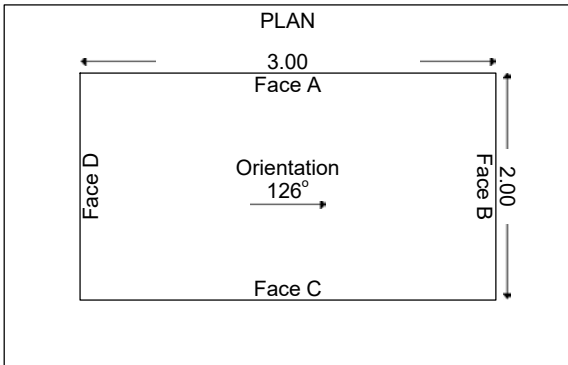
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			<b>Exploratory Hole No.</b>	
Client: AMEY OW Limited		Location: E:413993.710 N:509592.026		<b>TP SBC013</b>
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 166.575	Start Date: 03/02/2021	Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20	J1 ES2			166.38		0.20	Grass over brown slightly sandy silty/clayey TOPSOIL with occasional rootlets.
0.50	J3			(0.70)			Soft orangish brown sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular and include sandstone.
1.00 1.00	B4 ES5			165.68		0.90	between c.0.20-0.25m BGL ... light brown in colour.
1.50	J6			(1.70)			Soft to firm brownish blue slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
2.00	B7						
2.50 2.50	ES8 J9			163.98		2.60	Firm blue slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone and sandstone. Cobbles are angular and include mudstone and sandstone.
3.00	B10			(1.90)			at c.3.00m BGL ... clay is of low plasticity.
3.50	J11						
4.00 4.00	B12 ES13			162.08		4.50	at c.4.50m BGL ... clay is of low plasticity.
4.50	J14						Complete at 4.50m BGL.



**GROUNDWATER**  
Slight water seepage at 1.90m BGL.

**STABILITY**  
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	G	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC013</b>
Client: AMEY OW Limited	Location: E:413993.710 N:509592.026		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.575	Start Date: 03/02/2021	Sheet: 2 of 4

**Figure TP SBC013.1  
TP SBC013**



**Figure TP SBC013.2  
TP SBC013**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:413993.710 N:509592.026		TP SBC013
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.575	Start Date: 03/02/2021	Sheet: 3 of 4

Figure TP SBC013.3  
TP SBC013



Figure TP SBC013.4  
TP SBC013







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC013</b>
Client: AMEY OW Limited	Location: E:413993.710 N:509592.026		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 166.575	Start Date: 03/02/2021	Sheet: 4 of 4

**Figure TP SBC013.5**  
**TP SBC013**







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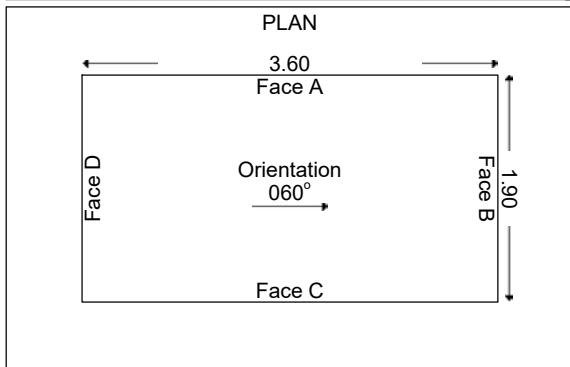
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC014</b>	
Client: AMEY OW Limited		Location: E:414120.191 N:509582.347	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 162.061	Start Date: 24/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10	J1	85 (29)kPa	↓	161.86	(0.20)	0.20	TOPSOIL (Dark grey brown organic slightly sandy clay with many rootlets. Sand is fine).		
0.30	J2			161.66	(0.40)	0.40	Grey brown sandy to very sandy slightly gravelly slightly organic CLAY with occasional rootlets.		
0.30	ES3								
0.40-0.60	B4						(0.60)	Soft to firm brown slightly sandy slightly gravelly CLAY/SILT with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, metamorphic lithologies and mudstone. Cobbles are subangular and include sandstone and limestone.	
0.80	J5					161.06		1.00	at c.0.40m BGL ... clay is of low plasticity.
0.80-1.00	B6								Brown very clayey sandy GRAVEL brown with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular and include sandstone and limestone.
1.20	ES7								
1.50	J8							(1.40)	
1.60-1.80	B9								
2.00	J10								
2.00-2.20	B11								
2.20	ES12					159.66		2.40	
2.50	J13							(0.60)	
2.80-3.00	B14								
2.80	HSV					159.06		3.00	
3.00	ES15						Terminated at 3.00m BGL - due to repeated collapse.		



**GROUNDWATER**  
 Water strike at 1.00m BGL.

**STABILITY**  
 Pit sides and base unstable throughout excavation. Repeated collapse and Spalling of Face A and Face C.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing between 0.40-2.40m BGL (sandy/gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC014	
Client: AMEY OW Limited	Location: E:414120.191 N:509582.347		Sheet: 2 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 162.061	Start Date: 24/02/2021	

Figure TP SBC014.1  
TP SBC014



Figure TP SBC014.2  
TP SBC014







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC014</b>
Client: AMEY OW Limited	Location: E:414120.191 N:509582.347		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 162.061	Start Date: 24/02/2021	Sheet: 3 of 4

Figure TP SBC014.3  
TP SBC014



Figure TP SBC014.4  
TP SBC014







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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC014</b>	
Client: AMEY OW Limited	Location: E:414120.191 N:509582.347		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 162.061	Start Date: 24/02/2021	Sheet: 4 of 4

Figure TP SBC014.5  
TP SBC014



Figure TP SBC014.6  
TP SBC014







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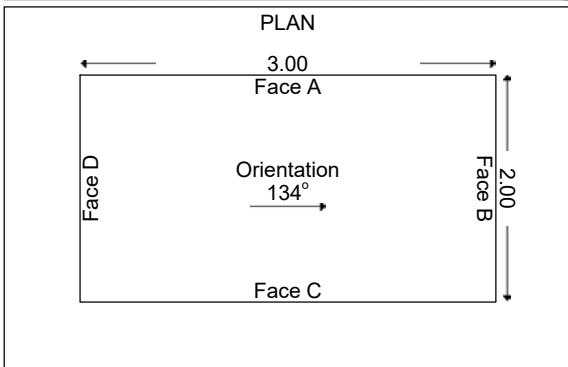
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:414117.610 N:509516.086		<b>TP SBC015</b>
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 158.938	Start Date: 03/02/2021	Sheet: 1 of 4

SAMPLES & TESTS			STRATA			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description
0.10 0.20	J1 ES2			158.74	(0.20)	Grass over brown slightly sandy silty/clayey TOPSOIL with occasional rootlets.
0.50	J3				(1.10)	Orangish brown very clayey very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular and include sandstone. at c.0.50m BGL ... clay is of low plasticity.
1.00 1.00	B4 ES5			157.64	(1.30)	
1.50	J6				(1.50)	Soft to firm brownish blue very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are subangular to rounded and include sandstone and limestone.
2.00	B7				(2.80)	
2.50 2.50	J8 ES9			156.14	(3.20)	Firm to stiff blue sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone and sandstone. Cobbles are angular and include mudstone and sandstone.
3.00	B10				(6.00)	
3.50	J11					
4.00	B12					
4.50	J13					
5.00	B14					
5.50	J15					
6.00	B16			152.94	(6.00)	Complete at 6.00m BGL.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:51.67	For explanation of symbols and abbreviations see Key Sheets	C [Redacted]	Logged by: M. Bell	Contract No. <b>4322A</b>
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414117.610 N:509516.086		TP SBC015
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 158.938	Start Date: 03/02/2021	Sheet: 2 of 4

Figure TP SBC015.1  
TP SBC015



Figure TP SBC015.2  
TP SBC015





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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No.  <b>TP SBC015</b>
Client: AMEY OW Limited	Location: E:414117.610 N:509516.086		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 158.938	Start Date: 03/02/2021	Sheet: 3 of 4

**Figure TP SBC015.3**  
**TP SBC015**



**Figure TP SBC015.4**  
**TP SBC015**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414117.610 N:509516.086		TP SBC015
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 158.938	Start Date: 03/02/2021	Sheet: 4 of 4

Figure TP SBC015.5  
TP SBC015



Figure TP SBC015.6  
TP SBC015







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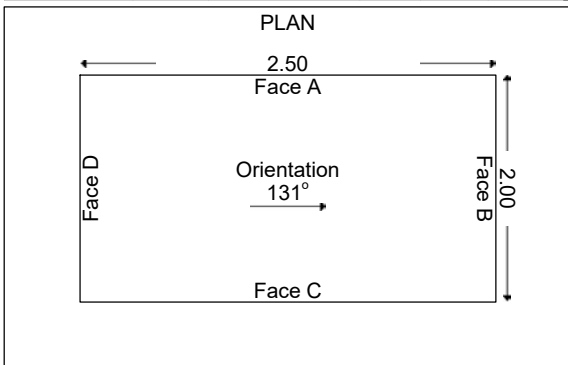
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC016	
Client: AMEY OW Limited		Location: E:414204.948 N:509462.435	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 152.799	Start Date: 04/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1		Water	152.60		0.20	Brown silty/clayey TOPSOIL.	
0.20	ES2					(0.60)	Soft grey mottled brownish orange very sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to subrounded and include sandstone and limestone.	
0.50	J3			152.00		0.80		
1.00	B4					(1.90)	Firm brownish blue slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are subrounded and include sandstone and limestone. at c.1.50m BGL ... clay is of intermediate plasticity.	
1.00	ES5							
1.50	J6							
2.00	B7							
2.50	ES8				150.10		2.70	Stiff blue sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and include mudstone, sandstone and limestone. Cobbles are angular to subrounded and include sandstone and limestone. between c.2.70-4.50m BGL ... occasional pockets of brown sand.
2.50	J9							
3.00	B10							
3.50	J11					(1.80)		
4.00	B12							
4.50	J13				148.30		4.50	Complete at 4.50m BGL.



**GROUNDWATER**  
 Water level at 4.47m BGL (Seepage from soakaway).

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: M. Bell	Contract No. 4322A
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414204.948 N:509462.435		TP SBC016
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.799	Start Date: 04/03/2021	Sheet: 2 of 4

Figure TP SBC016.1  
TP SBC016



Figure TP SBC016.2  
TP SBC016







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC016</b>
Client: AMEY OW Limited	Location: E:414204.948 N:509462.435		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.799	Start Date: 04/03/2021	Sheet: 3 of 4

**Figure TP SBC016.3  
TP SBC016**



**Figure TP SBC016.4  
TP SBC016**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414204.948 N:509462.435		TP SBC016
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.799	Start Date: 04/03/2021	Sheet: 4 of 4

Figure TP SBC016.5  
TP SBC016



Figure TP SBC016.6  
TP SBC016





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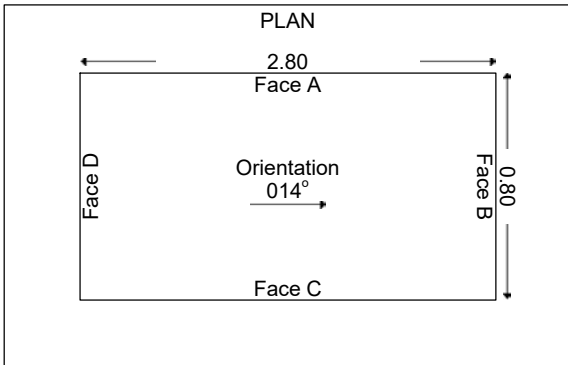
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		TP SBC017	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Location: E:414264.937 N:509502.337	Sheet: 1 of 5
		Ground Level (m): 153.226	Start Date: 01/03/2021

SAMPLES & TESTS			STRATA							
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description				
0.20	J1	79 (33)kPa	☞	152.93		TOPSOIL (Brownish grey slightly sandy organic clay with many rootlets).				
0.40	J2			(0.40)		Firm yellow brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies.				
0.40-0.60	ES3			152.53	0.70		Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies.			
0.50	B4			152.13	(0.40)		Grey and grey brown clayey sandy GRAVEL with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone.			
0.80	HSV				1.10		Stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies.			
0.80-1.00	J5				(0.70)		Stiff grey mottled brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies.			
1.20	B6			151.43	☞	1.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.		
1.20	ES8								(4.00)	
1.20-1.40	B9									
2.00	B10	106 (39)kPa	☞	5.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.				
2.20	ES11						(4.00)			
2.50	J12									
3.00-3.20	B13	109 (41)kPa	☞	5.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.				
3.00	HSV						(4.00)			
3.20	ES14									
3.50	J15	117 (41)kPa	☞	5.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.				
4.00-4.20	B16						(4.00)			
4.00	HSV									
4.20	ES17	117 (41)kPa	☞	5.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.				
4.30	J18									
5.00-5.20	B19	117 (41)kPa	☞	5.80		Stiff grey slightly sandy slightly gravelly, locally gravelly, CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone and metamorphic lithologies.				
5.00	HSV						(4.00)			
5.20	ES20									
5.80	J21					Terminated at 5.80m BGL - due to slow progress.				



**GROUNDWATER**  
Water seepages between 0.70-1.10m BGL.

**STABILITY**  
Pit sides Spalling between 1.10-1.80m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Unsuitable for HSV testing between 1.10-1.80m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC017</b>
Client: AMEY OW Limited	Location: E:414264.937 N:509502.337		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.226	Start Date: 01/03/2021	Sheet: 2 of 5

**Figure TP SBC017.1  
TP SBC017**



**Figure TP SBC017.2  
TP SBC017**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC017</b>
Client: AMEY OW Limited	Location: E:414264.937 N:509502.337		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.226	Start Date: 01/03/2021	Sheet: 3 of 5

**Figure TP SBC017.3  
TP SBC017**



**Figure TP SBC017.4  
TP SBC017**







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC017</b>
Client: AMEY OW Limited	Location: E:414264.937 N:509502.337		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.226	Start Date: 01/03/2021	Sheet: 4 of 5

**Figure TP SBC017.5**  
TP SBC017



**Figure TP SBC017.6**  
TP SBC017







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414264.937 N:509502.337		TP SBC017
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.226	Start Date: 01/03/2021	Sheet: 5 of 5

Figure TP SBC017.7  
TP SBC017







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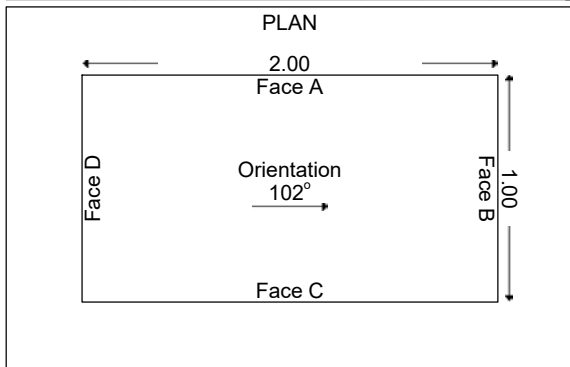
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC018</b>	
Client: AMEY OW Limited		Location: E:414340.922 N:509541.084	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 153.931	Start Date: 01/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	J1	83 (27)kPa	Water	153.58		0.35	TOPSOIL (Firm brown grey slightly sandy organic clay with many rootlets. Sand is fine).	
0.40	J2			(0.45)	(0.45)		(1.80)	Firm yellowish brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
0.40	ES3							
0.40-0.60	J4							
0.50	HSV							
0.90	J5							
1.00-1.20	B6							
1.20	ES7	106 (41)kPa	Water	151.33		2.60	Firm brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone. at c.1.80m BGL ... clay is of intermediate plasticity. below c.2.00m BGL ... becoming grey mottled brown.	
1.80	J8			(1.90)	(1.90)		(4.50)	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
2.00-2.20	B9							
2.20	ES10							
2.70	J11	149.43	Water	(4.50)	(4.50)		Complete at 4.50m BGL.	
3.00-3.20	B12							
3.50	J13							
3.50	HSV	149.43	Water	(4.50)	(4.50)		Complete at 4.50m BGL.	
4.00-4.20	B14							
4.50	J15							



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Soakaway test undertaken in the trial pit at 2.00m BGL.  
 (2) Unsuitable for HSV testing between 0.80-2.60m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	[Redacted]	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC018</b>
Client: AMEY OW Limited	Location: E:414340.922 N:509541.084		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.931	Start Date: 01/03/2021	Sheet: 2 of 4

**Figure TP SBC018.1  
TP SBC018**



**Figure TP SBC018.2  
TP SBC018**







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414340.922 N:509541.084		TP SBC018
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.931	Start Date: 01/03/2021	Sheet: 3 of 4

Figure TP SBC018.3  
TP SBC018



Figure TP SBC018.4  
TP SBC018







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414340.922 N:509541.084		TP SBC018
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.931	Start Date: 01/03/2021	Sheet: 4 of 4

**Figure TP SBC018.5  
TP SBC018**





# ALLIED EXPLORATION & GEOTECHNICS LIMITED



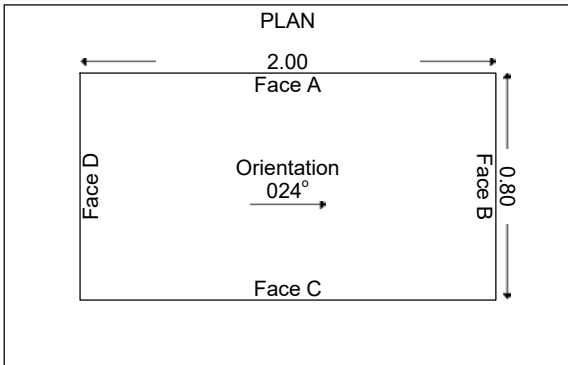
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC019</b>	
Client: AMEY OW Limited		Location: E:414348.151 N:509466.253	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 151.592	Start Date: 02/03/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA							
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description			
0.20	J1	72 (28)kPa	Water	151.34		0.25	TOPSOIL (Firm brownish grey slightly sandy slightly gravelly organic clay with many rootlets. Gravel is fine to coarse angular to subrounded and includes sandstone and mudstone).			
0.30	J2			150.89		(0.45)	Firm grey mottled yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies.			
0.40-0.60	B4					at c.0.30m BGL ... clay is of intermediate plasticity.				
0.40	HSV			1.00-1.20		(1.90)	Firm grey mottled brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, limestone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.			
0.80	J5						at c.0.70m BGL ... clay is of intermediate plasticity.			
1.00-1.20	B6						between c.1.40-1.70m BGL ... bands of gravel and large boulders.			
1.20	ES7			98 (41)kPa	Water	148.99		2.60	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.	
1.80	J8	(1.90)	147.09						4.50	Complete at 4.50m BGL.
2.00-2.20	B9									
2.20	ES10									
2.50	J11	98 (41)kPa	Water	147.09		4.50	Complete at 4.50m BGL.			
3.00-3.20	B12									
3.50	J13									
4.00-4.20	B14	98 (41)kPa	Water	147.09		4.50	Complete at 4.50m BGL.			
4.00	HSV									
4.50	J15									



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Unsuitable for HSV testing between 0.70-2.60m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC019</b>	
Client: AMEY OW Limited	Location: E:414348.151 N:509466.253		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 151.592	Start Date: 02/03/2021	Sheet: 2 of 4

Figure TP SBC019.1  
TP SBC019



Figure TP SBC019.2  
TP SBC019







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414348.151 N:509466.253		TP SBC019
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 151.592	Start Date: 02/03/2021	Sheet: 3 of 4

Figure TP SBC019.3  
TP SBC019



Figure TP SBC019.4  
TP SBC019







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC019	
Client: AMEY OW Limited	Location: E:414348.151 N:509466.253		Sheet: 4 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 151.592	Start Date: 02/03/2021	

Figure TP SBC019.5  
TP SBC019



Figure TP SBC019.6  
TP SBC019







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

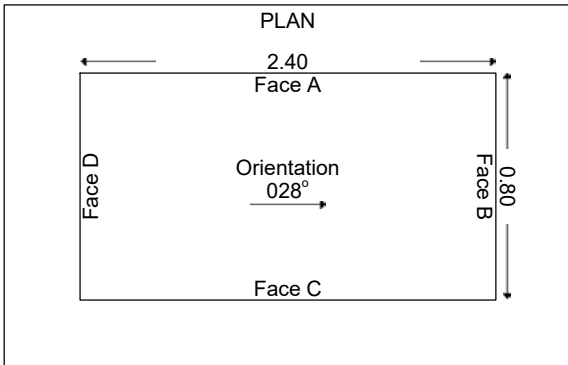
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC020</b>	
Client: AMEY OW Limited		Location: E:414507.489 N:509439.853	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 153.342	Start Date: 02/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	J1	73 (27)kPa		153.09		0.25	TOPSOIL (Firm brownish grey slightly sandy slightly gravelly clay with many rootlets. Sand is fine. Gravel is fine to coarse angular to subrounded and includes sandstone and metamorphic lithologies).	
0.30	J2							Firm yellowish brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.
0.30	ES3							
0.40	J4							
0.40-0.60	B5							
0.50	HSV							
0.70	J6							
1.00-1.20	B7							
1.20	ES8							
1.50	J9							
2.00-2.20	B10							
2.20	ES11			150.94	2.40			
2.50	J12							
3.00-3.20	B13			(1.90)				
3.50	J14							
4.00-4.20	B15			149.04	4.30			
4.30	J16					Terminated at 4.30m BGL - due to high boulder content.		



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414507.489 N:509439.853		TP SBC020
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.342	Start Date: 02/03/2021	Sheet: 2 of 4

Figure TP SBC020.1  
TP SBC020



Figure TP SBC020.2  
TP SBC020







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414507.489 N:509439.853		TP SBC020
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.342	Start Date: 02/03/2021	Sheet: 3 of 4

Figure TP SBC020.3  
TP SBC020



Figure TP SBC020.4  
TP SBC020







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414507.489 N:509439.853		TP SBC020
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.342	Start Date: 02/03/2021	Sheet: 4 of 4

Figure TP SBC020.5  
TP SBC020



Figure TP SBC020.6  
TP SBC020







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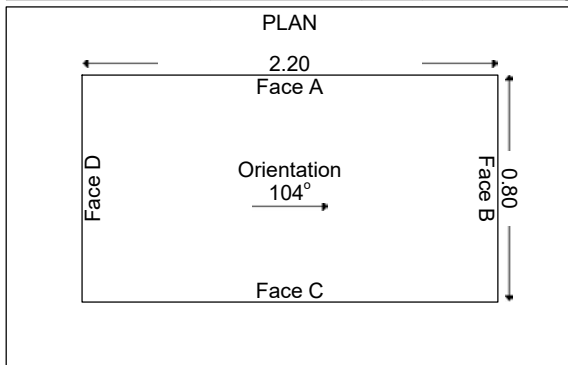
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC021</b>	
Client: AMEY OW Limited		Location: E:414630.662 N:509419.080	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 153.693	Start Date: 02/03/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1	76 (26)kPa		153.44		0.25	TOPSOIL (Firm brown grey slightly sandy slightly gravelly organic CLAY with many rootlets. Sand is fine. Gravel is fine to coarse angular to subrounded and includes sandstone and mudstone).	
0.30	J2			(0.45)		0.70	Firm grey mottled yellowish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies.	
0.30	ES3							
0.40-0.60	B4					1.90	Firm brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and limestone. at c.1.50m BGL ... clay is of low plasticity.	
0.50	HSV							
0.80	J5					2.60	Greyish brown slightly clayey slightly gravelly fine to medium SAND. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies.	
1.00-1.20	B6							
1.20	ES7					2.80	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.	
1.50	J8							
2.00-2.20	B9				4.50	Complete at 4.50m BGL.		
2.20	ES10							
2.50	J11	103 (39)kPa			151.09		2.60	
2.80	J12				150.89		2.80	
3.00-3.20	B13					1.70		
3.50	J14							
3.50	HSV					4.50		
4.00-4.20	B15							
4.50	J16				149.19		4.50	



**GROUNDWATER**  
Water seepage between 2.60-2.80m BGL.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Unsuitable for HSV testing between 0.70-2.60m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C		Logged by: J. Beckett	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414630.662 N:509419.080		TP SBC021
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.693	Start Date: 02/03/2021	Sheet: 2 of 4

Figure TP SBC021.1  
TP SBC021



Figure TP SBC021.2  
TP SBC021







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414630.662 N:509419.080		TP SBC021
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.693	Start Date: 02/03/2021	Sheet: 3 of 4

Figure TP SBC021.3  
TP SBC021



Figure TP SBC021.4  
TP SBC021







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414630.662 N:509419.080		TP SBC021
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 153.693	Start Date: 02/03/2021	Sheet: 4 of 4

Figure TP SBC021.5  
TP SBC021



Figure TP SBC021.6  
TP SBC021







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

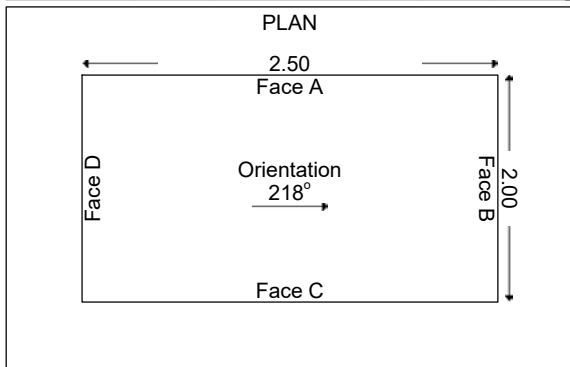
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC022	
Client: AMEY OW Limited		Location: E:414282.055 N:509384.076	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 147.640	Start Date: 04/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1			147.39		0.25	Grass over brown silty/clayey TOPSOIL with occasional rootlets.	
0.20	ES2					(0.55)	Soft grey mottled brownish orange very sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and includes sandstone.	
0.50	J3				146.84		0.80	Greyish blue clayey SAND and GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
1.00	B4				146.54		1.10	Firm blue sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include mudstone, sandstone and limestone.
1.00	ES5							
1.50	J6							
2.00	B7							
2.50	ES8							
2.50	J9						(3.40)	
3.00	B10							
3.50	J11							at c.3.50m BGL ... clay is of low plasticity. at c.3.60-4.50m BGL ... stiff.
4.00	B12							at c.4.00m BGL ... slightly sandy slightly gravelly clay.
				143.14		4.50	Complete at 4.50m BGL.	



**GROUNDWATER**  
Water seepage at 1.50m BGL.

**STABILITY**  
Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Soakaway test undertaken in the trial pit at 2.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C [Redacted]	Logged by: M. Bell	Contract No. 4322A
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414282.055 N:509384.076		TP SBC022
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.640	Start Date: 04/03/2021	Sheet: 2 of 4

Figure TP SBC022.1  
TP SBC022



Figure TP SBC022.2  
TP SBC022







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414282.055 N:509384.076		TP SBC022
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.640	Start Date: 04/03/2021	Sheet: 3 of 4

Figure TP SBC022.3  
TP SBC022



Figure TP SBC022.4  
TP SBC022







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414282.055 N:509384.076		TP SBC022
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.640	Start Date: 04/03/2021	Sheet: 4 of 4

Figure TP SBC022.5  
TP SBC022



Figure TP SBC022.6  
TP SBC022







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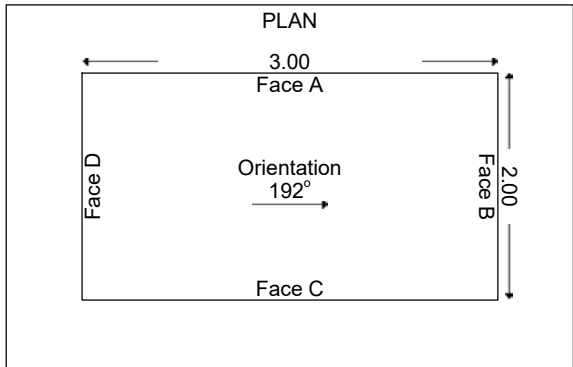
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC023</b>	
Client: AMEY OW Limited		Location: E:414844.026 N:509397.069	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 148.378	Start Date: 03/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1			148.13		0.25	Brown sandy clayey TOPSOIL with occasional rootlets.	
0.20	ES2							
0.40	J3						(0.70)	Yellow slightly gravelly clayey SAND with cobbles noted. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
					147.43		0.95	
1.00	B4							
1.00	ES5						(0.85)	Bluish dark brown clayey/silty sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
1.50	J6						1.80	at c.1.50m BGL ... clay/silt fines are of low plasticity.
2.00	B7						(0.70)	Greyish blue clayey sandy GRAVEL with medium to high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone and sandstone. Cobbles are angular to rounded and include sandstone and limestone.
					145.88		2.50	
2.50	ES8							
2.50	J9						2.70	Firm blue very sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone and sandstone.
2.60	B10							
3.00	B11						(0.90)	Greyish blue SAND and GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone and sandstone. Cobbles are angular to rounded and include sandstone and limestone.
3.50	J12						3.60	
4.00	B13					(0.90)	Stiff blue very sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone and sandstone.	
				143.88		4.50		
4.50	J14						Complete at 4.50m BGL.	



**GROUNDWATER**  
 Slow water seepage at 2.00m BGL. Water level at 4.45m BGL on completion (engineer notes water level rising).

**STABILITY**  
 Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: M. Bell	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414844.026 N:509397.069		TP SBC023
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.378	Start Date: 03/02/2021	Sheet: 2 of 4

Figure TP SBC023.1  
TP SBC023



Figure TP SBC023.2  
TP SBC023







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:414844.026 N:509397.069	TP SBC023	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.378	Start Date: 03/02/2021	Sheet: 3 of 4

Figure TP SBC023.3  
TP SBC023



Figure TP SBC023.4  
TP SBC023







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC023	
Client: AMEY OW Limited	Location: E:414844.026 N:509397.069		Sheet: 4 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.378	Start Date: 03/02/2021	

Figure TP SBC023.5  
TP SBC023



Figure TP SBC023.6  
TP SBC023







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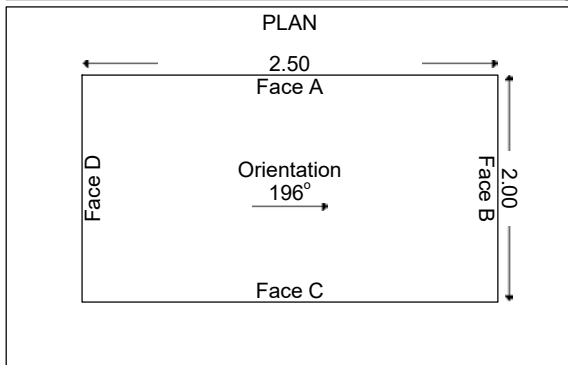
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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC024</b>	
Client: AMEY OW Limited		Location: E:415003.957 N:509285.237	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 144.164	Start Date: 24/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.15	J1	59 (27)kPa	Water	143.96		0.20	Brown clayey/silty TOPSOIL.		
0.20	ES2					(0.60)	Soft grey mottled orangish brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and includes limestone, mudstone and sandstone.		
0.50	J3						at c.0.50m BGL ... clay is of intermediate plasticity.		
0.50	HSV			143.36		0.80	Soft to firm orange mottled dark brown slightly sandy slightly gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone.		
1.00	B4								
1.00	ES5					(1.80)			
1.50	J6								
2.00	B7								
2.50	J8					141.56		2.60	
2.50	ES9					141.36		2.80	Brownish orange slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and include sandstone.
2.60	J10					(0.80)	Brown clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone. Cobbles are subrounded and include sandstone.		
3.00	B11								
3.50	ES12			140.56		3.60	Stiff bluish grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes limestone, mudstone and sandstone. Cobbles are angular to subrounded and include sandstone and limestone.		
3.60	J13					(0.90)			
4.00	B14								
4.30	J15			139.66		4.50	Complete at 4.50m BGL.		
4.50	ES16								



**GROUNDWATER**  
Water seepage at 4.50m BGL.

**STABILITY**  
Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: [Redacted]	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415003.957 N:509285.237		TP SBC024
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.164	Start Date: 24/02/2021	Sheet: 2 of 4

**Figure TP SBC024.1  
TP SBC024**



**Figure TP SBC024.2  
TP SBC024**







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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415003.957 N:509285.237		TP SBC024
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.164	Start Date: 24/02/2021	Sheet: 3 of 4

Figure TP SBC024.3  
TP SBC024



Figure TP SBC024.4  
TP SBC024







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415003.957 N:509285.237	TP SBC024	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.164	Start Date: 24/02/2021	Sheet: 4 of 4

Figure TP SBC024.5  
TP SBC024



Figure TP SBC024.6  
TP SBC024







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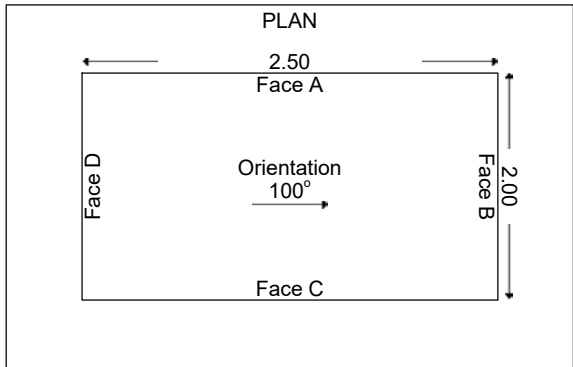
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC025</b>	
Client: AMEY OW Limited		Location: E:415087.379 N:509214.289	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 141.705	Start Date: 24/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description
0.15	J1	60 (31)kPa	(0.80)	141.51		Grass over blackish brown clayey/silty TOPSOIL with occasional rootlets and roots.
0.20	ES2			141.21		at c.0.15m BGL ... clay/silt fines of high plasticity.
0.40	J3					Brown very silty SUBSOIL with occasional rootlets.
0.50	J4					Soft to firm bluish mottled grey orangish brown slightly sandy slightly gravelly CLAY with low to medium cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and includes limestone, mudstone and sandstone.
0.50	HSV					Soft to firm orange mottled dark brown sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone.
1.00	ES5		(1.10)	140.41		Bluish grey very clayey SAND and GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and mudstone and sandstone. Cobbles are angular to rounded and include sandstone and limestone.
1.00	B6			139.81		Stiff bluish grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and include limestone, mudstone and sandstone.
1.50	J7		(1.50)	138.71		at c.2.00m BGL ... slightly sandy slightly gravelly clay.
2.00	B8					
2.50	J9					
2.50	ES10					
3.00	B11					
3.50	J12					
4.00	B13					
4.50	J14			137.21		Complete at 4.50m BGL.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: [Redacted]	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415087.379 N:509214.289		TP SBC025
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 141.705	Start Date: 24/02/2021	Sheet: 2 of 4

Figure TP SBC025.1  
TP SBC025



Figure TP SBC025.2  
TP SBC025







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415087.379 N:509214.289	TP SBC025	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 141.705	Start Date: 24/02/2021	Sheet: 3 of 4

Figure TP SBC025.3  
TP SBC025



Figure TP SBC025.4  
TP SBC025





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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC025</b>
Client: AMEY OW Limited	Location: E:415087.379 N:509214.289		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 141.705	Start Date: 24/02/2021	Sheet: 4 of 4

**Figure TP SBC025.5**  
**TP SBC025**



**Figure TP SBC025.6**  
**TP SBC025**







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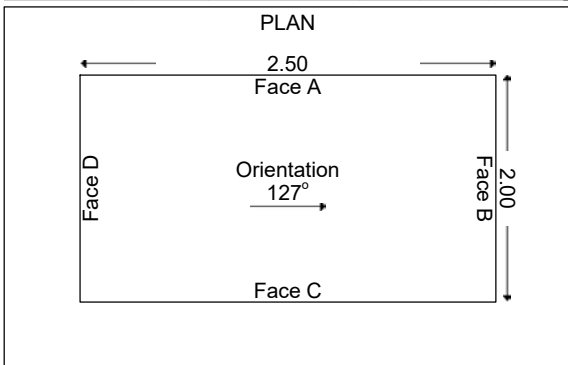
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC026</b>	
Client: AMEY OW Limited		Location: E:415117.214 N:509144.824	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 142.370	Start Date: 24/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20	J1 ES2			142.22		0.15	Grass over brown slightly sandy clayey TOPSOIL with occasional rootlets.
0.50 0.50	J3 HSV	49 (25)kPa				(1.05)	Soft grey mottled orangish brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are subangular to subrounded and include mudstone and sandstone.
1.00 1.00	ES4 B5			141.17		1.20	at c.0.50m BGL ... clay is of of to intermediate plasticity.
1.50 1.50	J6 HSV	49 (29)kPa		140.57		1.80	Soft to firm orange mottled dark brown sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone.
1.90 2.00	J7 B8					(0.60)	
2.50 2.50	J9 ES10			139.97		2.40	Soft bluish grey slightly sandy slightly gravelly CLAY intermixed with very clayey SAND and GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone and sandstone. Cobbles are subrounded to rounded and include sandstone and limestone.
3.00	B11						Stiff bluish grey sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes limestone, mudstone and sandstone.
3.50	J12					(2.10)	
4.00	B13						at c.4.00m BGL ... large boulders.
4.50	J14			137.87		4.50	Complete at 4.50m BGL.



**GROUNDWATER**  
Water seepage at 3.90m BGL.

**STABILITY**  
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Soakaway test undertaken in the trial pit at 2.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415117.214 N:509144.824		TP SBC026
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 142.370	Start Date: 24/02/2021	Sheet: 2 of 4

Figure TP SBC026.1  
TP SBC026



Figure TP SBC026.2  
TP SBC026







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415117.214 N:509144.824		TP SBC026
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 142.370	Start Date: 24/02/2021	Sheet: 3 of 4

Figure TP SBC026.3  
TP SBC026



Figure TP SBC026.4  
TP SBC026







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415117.214 N:509144.824		TP SBC026
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 142.370	Start Date: 24/02/2021	Sheet: 4 of 4

Figure TP SBC026.5  
TP SBC026



Figure TP SBC026.6  
TP SBC026







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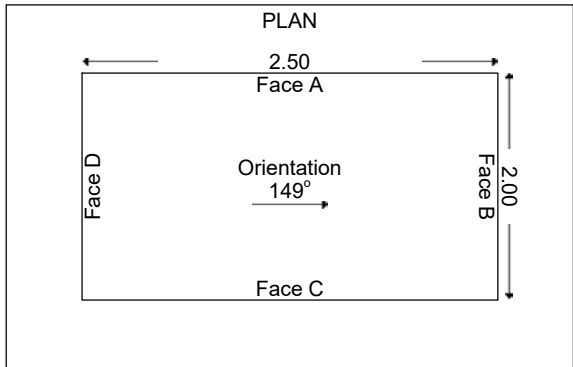
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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC027</b>	
Client: AMEY OW Limited		Location: E:415261.737 N:509092.824	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 146.977	Start Date: 25/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1	85 (45)kPa	Water	146.83		0.15	Brown clayey/silty TOPSOIL with many rootlets.
0.20	ES2			(0.45)	Soft bluish mottled grey orangish brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are subangular to rounded and include limestone, mudstone and sandstone.		
0.50	J3			146.38	0.60	Firm dark brown sandy gravelly CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone. Boulders are angular to rounded and include sandstone, limestone and mudstone.	
0.50	HSV						
1.00	B4						
1.00	ES5				(1.80)		
1.50	J6						
2.00	ES7						
2.00	B8				144.58	2.40	Soft blackish brown very sandy very gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes limestone, mudstone and sandstone. Cobbles are angular to subrounded and include mudstone and sandstone. at c.3.00m BGL ... slightly sandy slightly gravelly clay.
2.50	J9						
3.00	ES10				(1.30)		
3.00	B11						
3.50	J12				143.28	3.70	at c.3.50m BGL ... clay is of low plasticity.
4.00	ES13						
4.00	B14				(0.80)		Firm brown mottled blue slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone. Cobbles are angular and include mudstone.
4.50	J15		142.48	4.50	Complete at 4.50m BGL.		



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch [Redacted]	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415261.737 N:509092.824	TP SBC027	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.977	Start Date: 25/02/2021	Sheet: 2 of 4

Figure TP SBC027.1  
TP SBC027



Figure TP SBC027.2  
TP SBC027







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC027	
Client: AMEY OW Limited	Location: E:415261.737 N:509092.824		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.977	Start Date: 25/02/2021	Sheet: 3 of 4

Figure TP SBC027.3  
TP SBC027



Figure TP SBC027.4  
TP SBC027







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415261.737 N:509092.824		TP SBC027
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.977	Start Date: 25/02/2021	Sheet: 4 of 4

Figure TP SBC027.5  
TP SBC027



Figure TP SBC027.6  
TP SBC027







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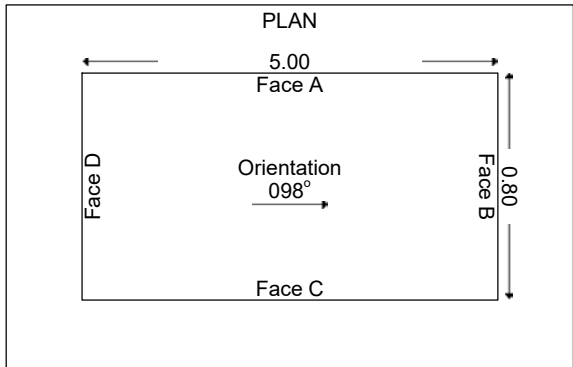
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC028</b>	
Client: AMEY OW Limited		Location: E:415363.662 N:509003.583	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 149.436	Start Date: 25/02/2021
			Sheet: 1 of 5

SAMPLES & TESTS			STRATA								
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description					
0.20	J1	102 (45)kPa	Water	149.14	0.30	TOPSOIL (Greyish brown sandy slightly gravelly organic clay with many rootlets. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone).					
0.20	ES2			(1.00)	148.84	0.60	Firm orange brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone. Cobbles are angular to subrounded and include limestone, sandstone and mudstone.				
0.40	J3				(1.60)	147.84	1.60	Firm brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse subangular to subrounded and includes mudstone, sandstone and siltstone. Cobbles are subangular and include sandstone.			
0.40-0.60	B4							(1.30)	2.90	2.90	Firm dark brownish grey slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and metamorphic lithologies. Cobbles and boulders are subangular to subrounded and include sandstone.
0.70	J5										(2.10)
0.80	HSV	(2.10)	5.00	5.00	at c.4.50m BGL ... clay is of low plasticity.						
1.00-1.20	B6				(2.10)	5.00	5.00	5.00	5.00	Terminated at 5.00m BGL - due to limit of excavator.	
1.20	ES7	(2.10)	5.00	5.00						5.00	5.00
1.70	J8				(2.10)	5.00	5.00	5.00	5.00		
2.00-2.20	B9	(2.10)	5.00	5.00						5.00	5.00
2.20	ES10				(2.10)	5.00	5.00	5.00	5.00		
2.70	J11	(2.10)	5.00	5.00						5.00	5.00
3.00	J12				(2.10)	5.00	5.00	5.00	5.00		
3.00-3.20	B13	(2.10)	5.00	5.00						5.00	5.00
3.20	ES14				(2.10)	5.00	5.00	5.00	5.00		
3.50	J15	(2.10)	5.00	5.00						5.00	5.00
3.50	HSV				(2.10)	5.00	5.00	5.00	5.00		
4.00-4.20	B16	(2.10)	5.00	5.00						5.00	5.00
4.00	HSV				(2.10)	5.00	5.00	5.00	5.00		
4.20	ES17	(2.10)	5.00	5.00						5.00	5.00
4.50	J18				(2.10)	5.00	5.00	5.00	5.00		
4.80-5.00	B19	(2.10)	5.00	5.00						5.00	5.00
5.00	ES20				(2.10)	5.00	5.00	5.00	5.00		



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C [Redacted]	Logged by: J. Beckett	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415363.662 N:509003.583	TP SBC028	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.436	Start Date: 25/02/2021	Sheet: 2 of 5

Figure TP SBC028.1  
TP SBC028



Figure TP SBC028.2  
TP SBC028







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415363.662 N:509003.583		TP SBC028
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.436	Start Date: 25/02/2021	Sheet: 3 of 5

Figure TP SBC028.3  
TP SBC028



Figure TP SBC028.4  
TP SBC028







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415363.662 N:509003.583		TP SBC028
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.436	Start Date: 25/02/2021	Sheet: 4 of 5

Figure TP SBC028.5  
TP SBC028



Figure TP SBC028.6  
TP SBC028







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC028</b>
Client: AMEY OW Limited	Location: E:415363.662 N:509003.583		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.436	Start Date: 25/02/2021	Sheet: 5 of 5

**Figure TP SBC028.7  
TP SBC028**







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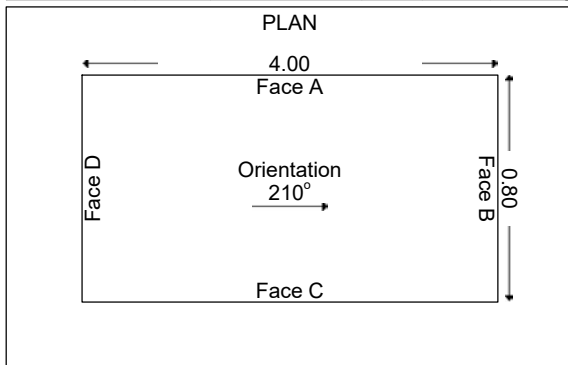
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC029	
Client: AMEY OW Limited		Location: E:415451.439 N:508847.207	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 146.234	Start Date: 25/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA										
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description						
0.10	J1	87 (39)kPa		145.98		0.25	TOPSOIL (Greyish brown organic slightly sandy slightly gravelly clay with many rootlets. Sand is fine. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone).						
0.30-0.50	B2			145.53		(0.45)	Firm orange brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and include sandstone, siltstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies. at c.0.30m BGL ... clay is of intermediate plasticity.						
0.30	J2					(2.00)		0.70	Firm dark brown mottled dark grey slightly sandy slightly gravelly CLAY with low to medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.				
0.50	HSV							143.53		2.70	Stiff to very stiff grey locally mottled grey brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.		
0.80	J4									(1.80)		4.50	Complete at 4.50m BGL.
1.00-1.20	B5											141.73	
1.20	ES6												
1.50	J7												
2.00-2.20	B8												
2.20	ES9												
2.50	J10												
2.80	J11												
3.00-3.20	B12												
3.50	J13	115 (43)kPa											
3.50	HSV												
4.00-4.20	B14												
4.50	J15												



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing between 0.70-2.70m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Che [redacted] by:	Logged by: J. Beckett	Contract No. 4322A
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415451.439 N:508847.207		TP SBC029
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.234	Start Date: 25/02/2021	Sheet: 2 of 4

Figure TP SBC029.1  
TP SBC029



Figure TP SBC029.2  
TP SBC029







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC029</b>
Client: AMEY OW Limited	Location: E:415451.439 N:508847.207		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.234	Start Date: 25/02/2021	Sheet: 3 of 4

**Figure TP SBC029.3  
TP SBC029**



**Figure TP SBC029.4  
TP SBC029**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415451.439 N:508847.207	TP SBC029	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.234	Start Date: 25/02/2021	Sheet: 4 of 4

Figure TP SBC029.5  
TP SBC029



Figure TP SBC029.6  
TP SBC029





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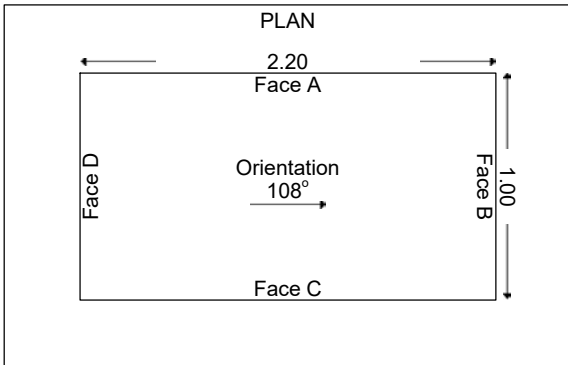
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		TP SBC030	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 146.560	Start Date: 04/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA							
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description				
0.20	J1	86 (34)kPa	Water	146.26	(0.30)	TOPSOIL (Firm brownish grey sandy organic clay. with many rootlets and relic plant remains. Sand is fine).				
0.40	J2			(0.50)	(0.80)	(0.90)	(1.60)	(1.20)	(4.50)	Firm grey mottled orange brown and brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include mudstone, sandstone, metamorphic lithologies and limestone.
0.40	ES3									
0.40-0.60	B4									
0.50	HSV									
0.90	J5									
1.00-1.20	B6									
1.20	ES7	Firm brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.								
1.50	J8	144.86	1.70	Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone, limestone and metamorphic lithologies. at c.2.50m BGL ... clay is of low plasticity.						
1.80	J9	107 (36)kPa	Water	(1.60)	(1.20)	(4.50)	(4.50)	(4.50)	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes metamorphic lithologies.	
2.00-2.20	B10									
2.20	ES11									
2.50	J12									
3.00-3.20	B13	143.26	3.30	Complete at 4.50m BGL.						
3.50	J14	107 (36)kPa	Water	(1.60)	(1.20)	(4.50)	(4.50)	(4.50)	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes metamorphic lithologies.	
4.00-4.20	B15									
4.00	HSV									
4.50	J16	142.06	4.50	Complete at 4.50m BGL.						



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Soakaway test undertaken in the trial pit at 2.00m BGL.  
 (2) Unsuitable for HSV testing between 0.80-3.30m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415969.925 N:508385.078		TP SBC030
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.560	Start Date: 04/03/2021	Sheet: 2 of 4

Figure TP SBC030.1  
TP SBC030



Figure TP SBC030.2  
TP SBC030







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC030</b>
Client: AMEY OW Limited	Location: E:415969.925 N:508385.078		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.560	Start Date: 04/03/2021	Sheet: 3 of 4

**Figure TP SBC030.3**  
**TP SBC030**



**Figure TP SBC030.4**  
**TP SBC030**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC030</b>
Client: AMEY OW Limited	Location: E:415969.925 N:508385.078		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.560	Start Date: 04/03/2021	Sheet: 4 of 4

Figure TP SBC030.5  
TP SBC030



Figure TP SBC030.6  
TP SBC030







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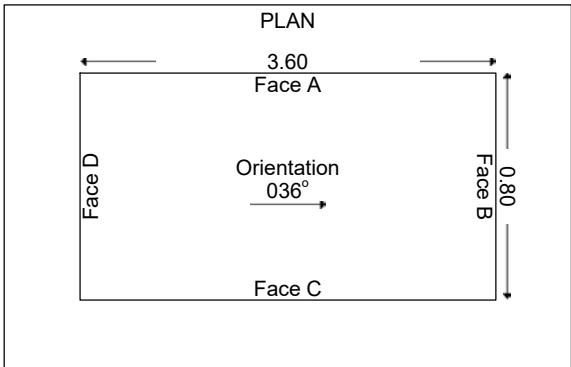
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:415579.635 N:508736.138	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 143.357	Start Date: 26/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1	97 (43)kPa	Water	143.16		0.20	TOPSOIL (Firm dark brown slightly sandy organic clay/silt with many rootlets and roots. Sand is fine).
0.30	J2			(0.40)	at c.0.10m BGL ... clay/silt is of high plasticity.		
0.30	ES3			142.76	0.60	Firm yellow brown mottled grey slightly sandy gravelly CLAY with traces of rootlets. Gravel is fine to coarse angular to subangular and includes sandstone and mudstone.	
0.40-0.60	B4						
0.40	HSV			141.56	1.80	Firm brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone, siltstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.	
0.70	J5						
0.80-1.00	B6						
1.20	ES7	140.66	2.70	Firm grey mottled brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone, siltstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.			
1.90	J8						
2.00-2.20	B9						
2.20	ES10						
2.50	J11	138.86	4.50	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.			
2.80	J12						
3.00-3.20	B13						
3.20	ES14						
3.50	J15						
3.50	HSV	122 (43)kPa	Water				Complete at 4.50m BGL.
4.00-4.20	B16						
4.20	ES17						
4.50	J18						



**GROUNDWATER**  
Water seepage in base of pit at 4.50m BGL.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	C	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC031	
Client: AMEY OW Limited	Location: E:415579.635 N:508736.138		Sheet: 2 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.357	Start Date: 26/02/2021	

Figure TP SBC031.1  
TP SBC031



Figure TP SBC031.2  
TP SBC031







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415579.635 N:508736.138		TP SBC031
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.357	Start Date: 26/02/2021	Sheet: 3 of 4

Figure TP SBC031.3  
TP SBC031



Figure TP SBC031.4  
TP SBC031







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC031</b>
Client: AMEY OW Limited	Location: E:415579.635 N:508736.138		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.357	Start Date: 26/02/2021	Sheet: 4 of 4

**Figure TP SBC031.5**  
**TP SBC031**







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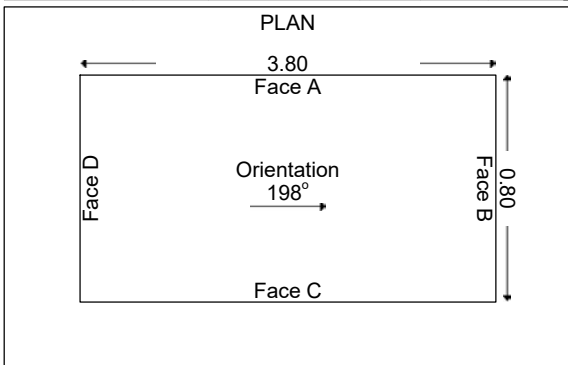
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC032	
Client: AMEY OW Limited		Location: E:415642.405 N:508948.965	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 143.839	Start Date: 26/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10 0.20-0.40 0.30 0.50 0.50-0.70 0.60	J1 B3 ES2 J4 B5 HSV	107 (41)kPa	Water	143.44		0.40	TOPSOIL (Firm grey slightly organic sandy slightly gravelly silty CLAY with occasional rootlets. Sand is fine). between c.0.20-0.40m BGL ... becomes sandy subsoil.	
1.00 1.00-1.20 1.20	J6 B7 ES8			142.94		0.90	Firm yellowish brown mottled grey sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes mudstone and sandstone.	
1.50	J9			142.04		1.80	Firm brown mottled grey slightly sandy to sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies. at c.1.50m BGL ... clay is of low plasticity.	
1.90 2.00-2.20 2.20	J10 B11 ES12			139.34		4.50	Stiff grey locally discoloured orange brown on fissures slightly sandy gravelly to gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, limestone and metamorphic lithologies.	
2.50	J13							
3.00-3.20 3.20	B14 ES15	121 (46)kPa					(2.70)	
3.50 3.50	J16 HSV							
4.00-4.20 4.20	B17 ES18							
4.50	J19							Complete at 4.50m BGL.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Unsuitable for HSV testing between 0.90-1.80m BGL (sand/cobbles).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Che [redacted] by:	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC032	
Client: AMEY OW Limited	Location: E:415642.405 N:508948.965		Sheet: 2 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.839	Start Date: 26/02/2021	

Figure TP SBC032.1  
TP SBC032



Figure TP SBC032.2  
TP SBC032







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415642.405 N:508948.965		TP SBC032
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.839	Start Date: 26/02/2021	Sheet: 3 of 4

Figure TP SBC032.3  
TP SBC032



Figure TP SBC032.4  
TP SBC032







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415642.405 N:508948.965	TP SBC032	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.839	Start Date: 26/02/2021	Sheet: 4 of 4

Figure TP SBC032.5  
TP SBC032



Figure TP SBC032.6  
TP SBC032







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

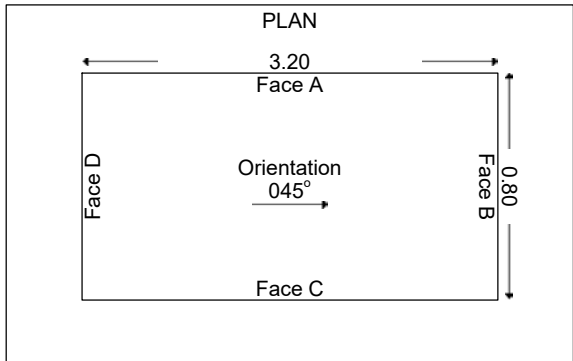
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC033</b>	
Client: AMEY OW Limited		Location: E:415656.053 N:508748.194	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 144.031	Start Date: 26/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1	75 (31)kPa		143.78		0.25	TOPSOIL (Firm brownish grey slightly sandy organic clay with many rootlets. Sand is fine).
0.30	J2			(0.45)	Firm yellow brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.		
0.30-0.50	ES3			143.33	0.70	Firm brown mottled grey slightly sandy, locally sandy, slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone and metamorphic lithologies.	
0.50	B4						
0.80	HSV						
1.00-1.20	J5						
1.20	B6	119 (42)kPa		142.23		1.80	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and includes sandstone and metamorphic lithologies.
1.50	ES7			(1.10)	Complete at 3.00m BGL.		
1.90	J8						
2.20	J9						
2.50	ES10						
2.50	J11						
2.80-3.00	HSV						
	B12			141.03		3.00	



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Unsuitable for HSV testing between 0.70-1.80m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch [Redacted]	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415656.053 N:508748.194		TP SBC033
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.031	Start Date: 26/02/2021	Sheet: 2 of 4

Figure TP SBC033.1  
TP SBC033



Figure TP SBC033.2  
TP SBC033







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415656.053 N:508748.194		TP SBC033
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.031	Start Date: 26/02/2021	Sheet: 3 of 4

Figure TP SBC033.3  
TP SBC033



Figure TP SBC033.4  
TP SBC033







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415656.053 N:508748.194		TP SBC033
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.031	Start Date: 26/02/2021	Sheet: 4 of 4

Figure TP SBC033.5  
TP SBC033



Figure TP SBC033.6  
TP SBC033







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

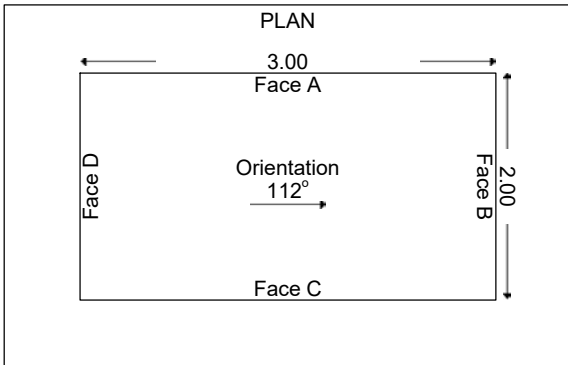
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC034	
Client: AMEY OW Limited		Location: E:416018.142 N:508414.568	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 147.750	Start Date: 01/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20	J1 ES2			147.40		0.35	Brown slightly sandy clayey/silty TOPSOIL with occasional rootlets.
0.50 0.70	J3 B4			146.85		0.90	Soft blue grey mottled orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. at c.0.50m BGL ... clay is of intermediate plasticity.
1.00 1.20 1.50 2.00	ES5 B6 J7 B8					1.80	Firm bluish dark brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Gravel is fine to coarse angular to subrounded and includes limestone, mudstone and sandstone. Cobbles are angular to rounded and include limestone, mudstone and sandstone.
2.50 2.50	J9 ES10			145.05		2.70	Firm blue very sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes mudstone. Cobbles are angular and include mudstone.
3.00 3.00	B11 J12			144.75		3.00	Complete at 3.00m BGL.



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Che [redacted] by:	Logged by: M. Bell	Contract No. 4322A
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416018.142 N:508414.568		TP SBC034
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.750	Start Date: 01/03/2021	Sheet: 2 of 4

Figure TP SBC034.1  
TP SBC034



Figure TP SBC034.2  
TP SBC034







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416018.142 N:508414.568		TP SBC034
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.750	Start Date: 01/03/2021	Sheet: 3 of 4

Figure TP SBC034.3  
TP SBC034



Figure TP SBC034.4  
TP SBC034







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416018.142 N:508414.568		TP SBC034
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.750	Start Date: 01/03/2021	Sheet: 4 of 4

Figure TP SBC034.5  
TP SBC034



Figure TP SBC034.6  
TP SBC034







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

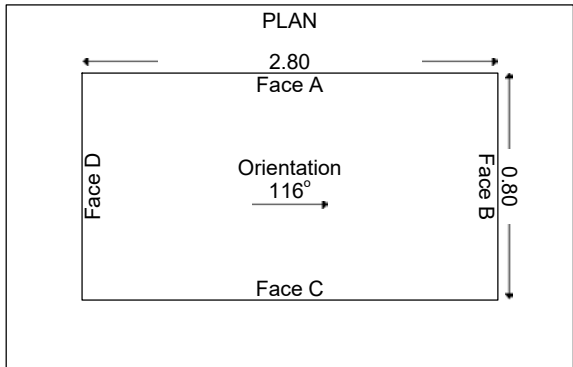
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC035</b>	
Client: AMEY OW Limited		Location: E:416028.027 N:508335.170	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 145.926	Start Date: 04/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1			145.58		0.35	TOPSOIL (Brownish grey slightly sandy to sandy organic clay with many rootlets and relic plant remains. Sand is fine). at c.0.20m BGL ... clay is of intermediate plasticity.
0.40	J2						Firm grey mottled yellow brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone.
0.40-0.60	ES3						
0.50	B4					(1.05)	
0.60	J5	89 (39)kPa					
1.00-1.20	B6						
1.20	ES7	81 (34)kPa		144.53		1.40	Firm brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
1.20	HSV						
1.50	J8					(0.70)	
1.80-2.00	B9			143.83		2.10	Firm dark brownish grey and grey slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone.
2.30-2.50	B12					(0.90)	
3.00	J13			142.93		3.00	Firm dark brownish grey and grey slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone. Boulders are subangular to subrounded and include sandstone. at c.3.00m BGL ... clay is of low plasticity. <i>Complete at 3.00m BGL.</i>



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Unsuitable for HSV testing between 1.40-2.10m BGL (recovered material too small).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416028.027 N:508335.170		TP SBC035
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.926	Start Date: 04/03/2021	Sheet: 2 of 4

Figure TP SBC035.1  
TP SBC035



Figure TP SBC035.2  
TP SBC035







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416028.027 N:508335.170	TP SBC035	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.926	Start Date: 04/03/2021	Sheet: 3 of 4

Figure TP SBC035.3  
TP SBC035



Figure TP SBC035.4  
TP SBC035







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416028.027 N:508335.170		TP SBC035
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.926	Start Date: 04/03/2021	Sheet: 4 of 4

Figure TP SBC035.5  
TP SBC035







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

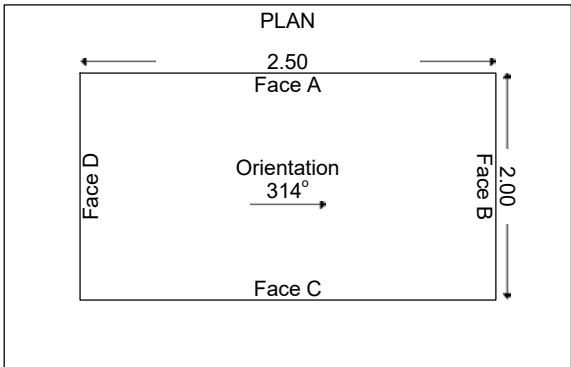
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC036</b>	
Client: AMEY OW Limited		Location: E:416264.377 N:508222.604	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 147.343	Start Date: 05/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1			147.14		0.20	Brown silty/clayey TOPSOIL with many rootlets and hay.
0.20	ES2					(0.60)	Soft bluish grey mottled orangish brown very sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and includes sandstone and limestone.
0.50	J3			146.54		0.80	at c.0.30m BGL ... clay is of intermediate plasticity.
1.00	B4					(2.50)	Soft to firm blue mottled dark brown very sandy very gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
1.00	ES5						
1.50	J6						
2.00	B7						
2.50	ES8						
2.50	J9						
3.00	B10			144.04		3.30	Soft blue silty CLAY. at c.3.50m BGL ... clay is of low plasticity.
3.50	J11					(1.20)	
4.00	B12						
4.50	J13			142.84		4.50	Complete at 4.50m BGL.



**GROUNDWATER**  
Water strike at 3.00m BGL. Water level at 4.50m BGL on completion.

**STABILITY**  
Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC036	
Client: AMEY OW Limited	Location: E:416264.377 N:508222.604		Sheet: 2 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.343	Start Date: 05/03/2021	

Figure TP SBC036.1  
TP SBC036



Figure TP SBC036.2  
TP SBC036







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416264.377 N:508222.604	TP SBC036	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.343	Start Date: 05/03/2021	Sheet: 3 of 4

Figure TP SBC036.3  
TP SBC036



Figure TP SBC036.4  
TP SBC036







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416264.377 N:508222.604		TP SBC036
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 147.343	Start Date: 05/03/2021	Sheet: 4 of 4

Figure TP SBC036.5  
TP SBC036



Figure TP SBC036.6  
TP SBC036







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

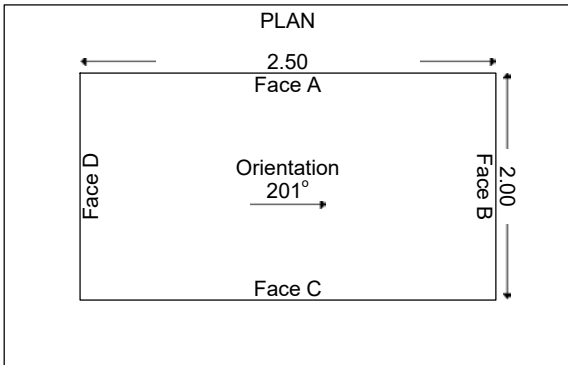
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC038</b>	
Client: AMEY OW Limited		Location: E:416508.635 N:508065.400	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 152.791	Start Date: 05/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1			152.64		0.15	Blackish brown clayey TOPSOIL with many rootlets and roots.
0.20	ES2					(0.60)	Light brown silty sandy SUBSOIL with occasional rootlets and roots.
0.50	J3			152.04		0.75	at c.0.50m BGL ... clay is of intermediate plasticity. at c.0.60m BGL ... cobbles of sandstone.
1.00	ES4			151.69		1.10	Soft grey mottled orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone.
1.00	B5					(1.20)	Soft to firm brownish blue sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes mudstone, sandstone and limestone. Cobbles are angular to subrounded and include sandstone and limestone.
1.50	J6						
2.00	B7			150.49		2.30	
2.50	ES8					(0.70)	Stiff blue slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to subrounded and include sandstone and limestone.
2.50	J9			149.79		3.00	
3.00	B10						Complete at 3.00m BGL.



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base moderately unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Che [redacted] by:	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416508.635 N:508065.400	TP SBC038	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.791	Start Date: 05/03/2021	Sheet: 2 of 4

Figure TP SBC038.1  
TP SBC038



Figure TP SBC038.2  
TP SBC038







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416508.635 N:508065.400		TP SBC038
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.791	Start Date: 05/03/2021	Sheet: 3 of 4

Figure TP SBC038.3  
TP SBC038



Figure TP SBC038.4  
TP SBC038







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416508.635 N:508065.400		TP SBC038
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 152.791	Start Date: 05/03/2021	Sheet: 4 of 4

Figure TP SBC038.5  
TP SBC038



Figure TP SBC038.6  
TP SBC038







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

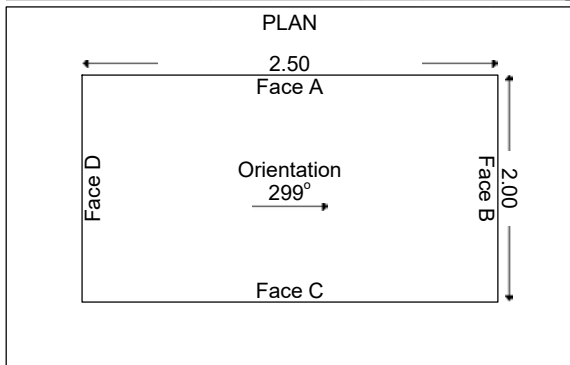
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC039	
Client: AMEY OW Limited		Location: E:416122.186 N:508192.523	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 148.186	Start Date: 05/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1						Brown silty/clayey TOPSOIL with occasional rootlets.
0.20	ES2			147.84		0.35	
				147.69		0.50	Brown slightly sandy clayey SUBSOIL.
0.50	J3					(0.40)	Soft bluish grey mottled orangish brown very sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and include mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone.
1.00	B4					0.90	
1.00	ES5						
1.50	J6					(1.90)	Soft to firm blue mottled dark brown slightly sandy slightly gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to subrounded and include sandstone and limestone.
2.00	B7						at c.1.50m BGL ... clay is of low plasticity.
2.50	ES8						at c.2.50m BGL ... clay is of low plasticity.
2.50	J9			145.39		2.80	from c.2.50m BGL ... rounded to subrounded boulders of limestone.
				145.19		3.00	between c.2.60-3.00m BGL ... pockets of brown sand.
3.00	B10						Soft to firm blue very sandy very gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to rounded and include sandstone and limestone. Complete at 3.00m BGL.



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Company: [Redacted]	Logged by: M. Bell	Contract No. 4322A
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416122.186 N:508192.523	TP SBC039	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.186	Start Date: 05/03/2021	Sheet: 2 of 4

Figure TP SBC039.1  
TP SBC039



Figure TP SBC039.2  
TP SBC039







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC039	
Client: AMEY OW Limited	Location: E:416122.186 N:508192.523		Sheet: 3 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.186	Start Date: 05/03/2021	

Figure TP SBC039.3  
TP SBC039



Figure TP SBC039.4  
TP SBC039







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416122.186 N:508192.523		TP SBC039
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 148.186	Start Date: 05/03/2021	Sheet: 4 of 4

Figure TP SBC039.5  
TP SBC039



Figure TP SBC039.6  
TP SBC039







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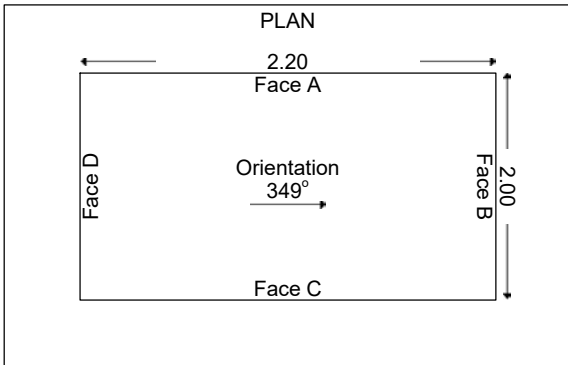
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		TP SBC040	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Location: E:416412.642 N:508036.042	Sheet: 1 of 5
		Ground Level (m): 146.764	Start Date: 08/03/2021

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20 0.40	J1 ES2 J3			146.46	[Cross-hatched symbol]	0.30	MADE GROUND (Topsoil comprising soft dark brown sandy slightly gravelly clay with some rootlets with fragments of ceramic tile. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone). at c.0.10m BGL ... clay is of intermediate plasticity.
0.80 0.80 1.00	B4 HSV ES5	51 (24)kPa			[Symbol with circles]	(1.80)	Soft grey mottled brown and dark grey slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. Cobbles are subangular to subrounded and includes sandstone, mudstone and limestone.
1.40	J6				[Symbol with circles]		
1.80 1.80	B7 HSV	50 (25)kPa		144.66	[Symbol with circles]	2.10	
2.40 2.50	J8 ES9				[Symbol with circles]	(0.90)	Firm to stiff dark grey very gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone, mudstone and limestone.
2.80 2.80	B10 HSV	81 (37)kPa		143.76	[Symbol with circles]	3.00	Complete at 3.00m BGL.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base unstable repeated collapse of Face A and Face C.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
(1) Soakaway test undertaken in the trial pit at 2.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Ch [Redacted]	Logged by: J. Myall	Contract No. <b>4322A</b>
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416412.642 N:508036.042		TP SBC040
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.764	Start Date: 08/03/2021	Sheet: 2 of 5

Figure TP SBC040.1  
TP SBC040



Figure TP SBC040.2  
TP SBC040







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416412.642 N:508036.042	TP SBC040	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.764	Start Date: 08/03/2021	Sheet: 3 of 5

Figure TP SBC040.3  
TP SBC040



Figure TP SBC040.4  
TP SBC040







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416412.642 N:508036.042	TP SBC040	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.764	Start Date: 08/03/2021	Sheet: 4 of 5

Figure TP SBC040.5  
TP SBC040



Figure TP SBC040.6  
TP SBC040







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416412.642 N:508036.042		TP SBC040
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 146.764	Start Date: 08/03/2021	Sheet: 5 of 5

Figure TP SBC040.7  
TP SBC040







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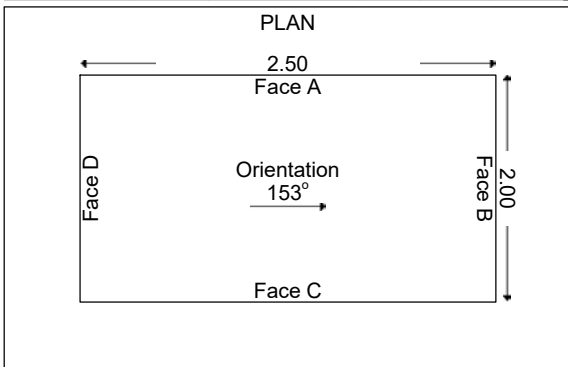
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC041</b>	
Client: AMEY OW Limited		Location: E:416449.484 N:507814.858	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 143.233	Start Date: 09/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1			142.93		0.30	MADE GROUND (Grass over black very sandy clayey topsoil with many rootlets. Sand is fine to coarse and includes roadstone).
0.20	ES2					(0.40)	Friable light brown sandy slightly gravelly clay with occasional roots. Gravel is fine to coarse angular to rounded and includes mudstone and sandstone. at c.0.50m BGL ... clay is of intermediate plasticity. at c.0.70m BGL ... whitish orange cobbles and boulders. Cobbles and boulders are angular and include sandstone. <i>Terminated at 0.70m BGL - due to archaeologist.</i>
0.50	J3			142.53		0.70	



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**  
 (1) Refer to Appendix II for archaeologist details.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: M. Bell	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416449.484 N:507814.858	TP SBC041	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.233	Start Date: 09/03/2021	Sheet: 2 of 4

Figure TP SBC041.1  
TP SBC041



Figure TP SBC041.2  
TP SBC041







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## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC041	
Client: AMEY OW Limited	Location: E:416449.484 N:507814.858		Sheet: 3 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.233	Start Date: 09/03/2021	

Figure TP SBC041.3  
TP SBC041



Figure TP SBC041.4  
TP SBC041







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC041</b>
Client: AMEY OW Limited	Location: E:416449.484 N:507814.858		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.233	Start Date: 09/03/2021	Sheet: 4 of 4

**Figure TP SBC041.5**  
**TP SBC041**







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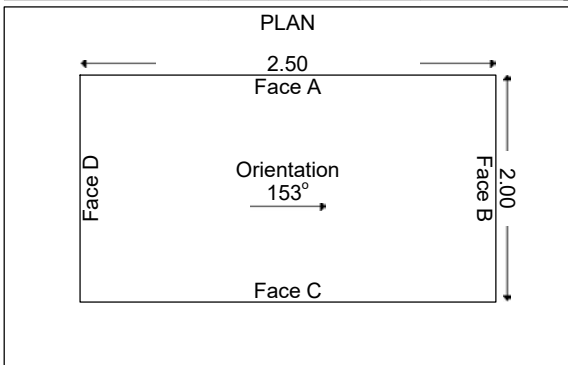
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC041A	
Client: AMEY OW Limited		Location: E:416449.636 N:507814.657	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 143.114	Start Date: 09/03/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
				142.81		0.30	MADE GROUND (Grass over black very sandy clayey topsoil with frequent rootlets. Sand is fine to coarse and includes roadstone).
				142.31		0.80	Friable light brown sandy slightly gravelly CLAY with occasional tree roots. Gravel is fine to coarse angular to rounded and includes mudstone and sandstone.
1.00	B1					(0.50)	Soft mottled bluish grey yellowish brown very sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are rounded and include limestone.
1.00	ES2						
1.50	J3					(2.10)	
2.00	B4						at c.2.00m BGL ... very clayey very sandy gravel and cobbles.
2.50	ES5						Soft mottled orange blue very sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to rounded and includes mudstone, sandstone and limestone. Cobbles are angular to subrounded and include limestone.
2.50	J6			140.21		2.90	
3.00	B7			140.11		3.00	from c.2.90m BGL ... pockets of orange brown sand. <i>Complete at 3.00m BGL.</i>
3.00	J8						



**GROUNDWATER**  
 No groundwater inflow observed.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: M. Bell	Contract No. 4322A
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416449.636 N:507814.657		TP SBC041A
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.114	Start Date: 09/03/2021	Sheet: 2 of 4

Figure TP SBC041A.1  
TP SBC041A



Figure TP SBC041A.2  
TP SBC041A







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416449.636 N:507814.657	TP SBC041A	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.114	Start Date: 09/03/2021	Sheet: 3 of 4

Figure TP SBC041A.3  
TP SBC041A



Figure TP SBC041A.4  
TP SBC041A







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416449.636 N:507814.657		TP SBC041A
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 143.114	Start Date: 09/03/2021	Sheet: 4 of 4

Figure TP SBC041A.5  
TP SBC041A



Figure TP SBC041A.6  
TP SBC041A







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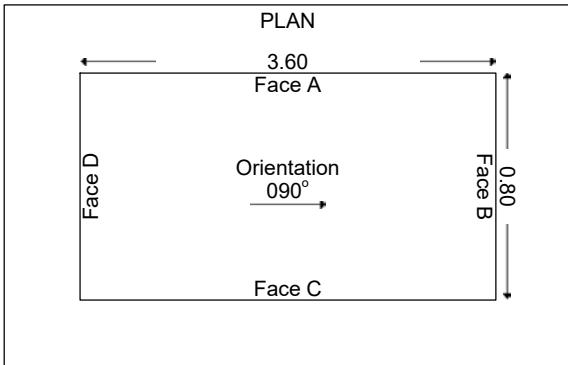
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC042</b>	
Client: AMEY OW Limited		Location: E:415877.969 N:508454.395	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 149.478	Start Date: 03/03/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description
0.10	J1	73 (25)kPa		149.18		TOPSOIL (Firm brownish grey slightly sandy organic clay with many rootlets. Sand is fine).
0.30	J2				(1.50)	Firm orange brown and brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include mudstone, sandstone and metamorphic lithologies. at c.0.30m BGL ... clay is of intermediate plasticity.
0.30	ES3					
0.30-0.50	B4					
0.50	HSV					
0.80	J5					
1.00-1.20	B6					
1.20	ES7	103 (37)kPa		147.68		Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
1.80	J8			(0.90)	Stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone, limestone and metamorphic lithologies.	
2.00-2.20	B9					
2.20	ES10					
2.50	J11					
2.80	J12					
3.00-3.20	B13					
3.50	J14	145.68		145.48	Strong to very strong dark grey slightly crystalline LIMESTONE. (Recovered as gravel and cobbles). Terminated at 4.00m BGL - due to an obstruction.	
3.50	HSV					
3.60-3.80	B15					
3.90	J16					
3.90-4.00	B17					



**GROUNDWATER**  
 Water at seepage at 3.80m BGL.

**STABILITY**  
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: J. Beckett	Contract No. <b>4322A</b>
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415877.969 N:508454.395		TP SBC042
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.478	Start Date: 03/03/2021	Sheet: 2 of 5

Figure TP SBC042.1  
TP SBC042



Figure TP SBC042.2  
TP SBC042







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC042</b>
Client: AMEY OW Limited	Location: E:415877.969 N:508454.395		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.478	Start Date: 03/03/2021	Sheet: 3 of 5

Figure TP SBC042.3  
TP SBC042



Figure TP SBC042.4  
TP SBC042







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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415877.969 N:508454.395		TP SBC042
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.478	Start Date: 03/03/2021	Sheet: 4 of 5

Figure TP SBC042.5  
TP SBC042



Figure TP SBC042.6  
TP SBC042







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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:415877.969 N:508454.395	TP SBC042	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 149.478	Start Date: 03/03/2021	Sheet: 5 of 5

Figure TP SBC042.7  
TP SBC042



Figure TP SBC042.8  
TP SBC042





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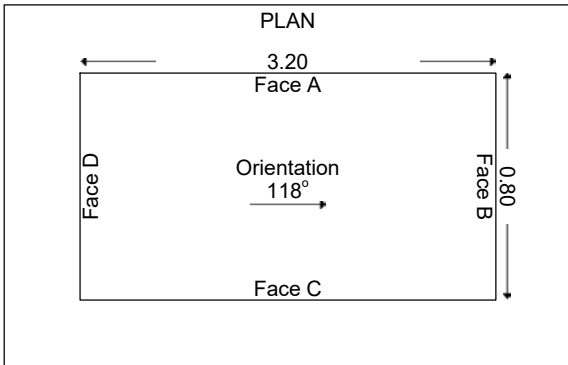
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:416028.865 N:508284.184	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 145.929	Start Date: 05/03/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	J1			145.63		0.30	TOPSOIL (Brownish grey slightly sandy slightly gravelly organic clay with frequent rootlets and relic plant remains. Sand is fine. Gravel is fine to coarse angular to subrounded and includes sandstone and mudstone).
0.40	J2					(0.50)	
0.40-0.60	B4						
0.40	ES5	75 (26)kPa		145.13		0.80	Firm grey mottled yellowish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and include sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.
0.50	HSV						
0.90	J5					(1.10)	
1.00-1.20	B6						
1.20	ES7					(1.10)	Firm brown mottled dark grey sandy to sandy slightly gravelly silty CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and include sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
1.50	J8			144.03		1.90	
2.00	J9					(1.60)	
2.20	ES10						
2.20-2.40	B11					(1.60)	Firm to stiff grey locally with brown mottling slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Gravel is fine to coarse angular to subrounded and include sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
2.50	J12						
3.00-3.20	B13					(1.60)	
3.50	J14			142.43		3.50	
3.50	HSV	59 (25)kPa				(0.90)	Firm grey slightly sandy CLAY with localised very thin silt partings. Gravel is fine to coarse angular to subangular and include sandstone and mudstone.
4.00-4.20	B15						
4.00	HSV	55 (19)kPa		141.53		4.40	
4.50	J16						
4.80	HSV	79 (27)kPa				(1.30)	Firm to stiff grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
5.00-5.20	B17						
5.70	J18			140.23		5.70	
							Terminated at 5.70m BGL - due to limit of excavator.



**GROUNDWATER**  
No groundwater inflow observed.

**STABILITY**  
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	G	Logged by: J. Beckett	Contract No. <b>4322A</b>
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC043	
Client: AMEY OW Limited	Location: E:416028.865 N:508284.184		Sheet: 2 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.929	Start Date: 05/03/2021	

Figure TP SBC043.1  
TP SBC034



Figure TP SBC043.2  
TP SBC034







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC043</b>
Client: AMEY OW Limited	Location: E:416028.865 N:508284.184		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.929	Start Date: 05/03/2021	Sheet: 3 of 4

**Figure TP SBC043.3  
TP SBC034**



**Figure TP SBC043.4  
TP SBC034**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416028.865 N:508284.184	TP SBC043	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 145.929	Start Date: 05/03/2021	Sheet: 4 of 4

Figure TP SBC043.5  
TP SBC034



Figure TP SBC043.6  
TP SBC034







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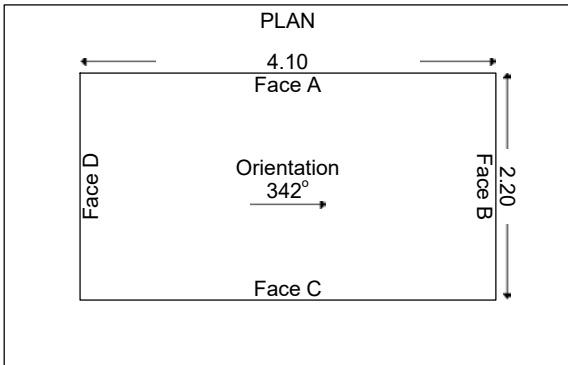
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. <b>TP SBC044</b>	
Client: AMEY OW Limited		Location: E:416279.780 N:508092.521	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 144.232	Start Date: 08/03/2021
		Sheet: 1 of 6	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1			143.63		0.60	TOPSOIL (Soft dark brown sandy slightly gravelly clay with moderate rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, limestone and ceramic tile).
0.30	ES2					0.60	
0.50	B3			142.33		1.30	Grey some orange mottling very silty slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. at c.0.80m BGL ... silt fines are of low plasticity.
0.80	J4						
1.00	ES5						at c.1.50m BGL ... sandy slightly gravelly clay.
1.50	B6			141.83		2.40	Grey sandy slightly clayey GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.
1.80	J7						
2.00	J8				3.60		Firm to stiff purplish dark grey very gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone, mudstone and limestone.
2.20	B9						
2.50	J10						
2.50	ES11	92 (43)kPa					
3.20	B12						
3.50	J13						
4.20	B14						
4.50	J15						
4.50	HSV						
5.20	B16						



**GROUNDWATER**  
Groundwater seepage at 2.40m BGL.

**STABILITY**  
Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:45.83	For explanation of symbols and abbreviations see Key Sheets	Checked by:	Logged by: J. Myall	Contract No. <b>4322A</b>
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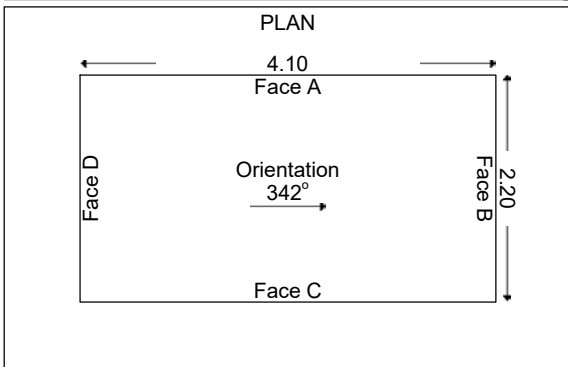
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No. TP SBC044	
Client: AMEY OW Limited		Location: E:416279.780 N:508092.521	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 144.232	Start Date: 08/03/2021
		Sheet: 2 of 6	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
5.50	J17			138.23		6.00	Complete at 6.00m BGL.



**GROUNDWATER**  
 Groundwater seepage at 2.40m BGL.

**STABILITY**  
 Pit sides and base unstable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

**GENERAL REMARKS**

All dimensions in metres Scale 1:45.83	For explanation of symbols and abbreviations see Key Sheets	Y:	Logged by: J. Myall	Contract No. 4322A
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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC044</b>
Client: AMEY OW Limited	Location: E:416279.780 N:508092.521		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.232	Start Date: 08/03/2021	Sheet: 3 of 6

**Figure TP SBC044.1  
TP SCB044**



**Figure TP SBC044.2  
TP SCB044**







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:416279.780 N:508092.521		TP SBC044
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.232	Start Date: 08/03/2021	Sheet: 4 of 6

Figure TP SBC044.3  
TP SCB044



Figure TP SBC044.4  
TP SCB044







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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## TRIAL PIT RECORD

Status:-  
**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC044</b>
Client: AMEY OW Limited	Location: E:416279.780 N:508092.521		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.232	Start Date: 08/03/2021	Sheet: 5 of 6

Figure TP SBC044.5  
TP SCB044



Figure TP SBC044.6  
TP SCB044







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## TRIAL PIT RECORD

Status:-

**FINAL**

Project: A66 North Trans Pennine Scheme C Section 9			Exploratory Hole No. <b>TP SBC044</b>
Client: AMEY OW Limited	Location: E:416279.780 N:508092.521		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 144.232	Start Date: 08/03/2021	Sheet: 6 of 6

**Figure TP SBC044.7  
TP SCB044**





**Groundwater Observations Made at the Time of Site Works**





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Regional Office: Unit 20 Business Development Centre, Eamam Wharf, Blackburn, BB1 5BL

## GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (WATER STRIKES)

Exploratory Hole No.	Date	Depth of Water (m)	Depth of Casing (m)	Depth Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
BH SBC005	25/02/2021	4.00	3.80		3.14	20	3.72	3.49	3.26	3.14	Water strike (moderate inflow).
BH SBC007	01/03/2021	3.00	2.80		1.54	20	2.31	2.18	1.82	1.54	Water strike (moderate inflow).
BH SBC008	24/02/2021	3.80	3.80		2.42	20	3.66	3.14	2.88	2.42	Water strike (moderate inflow).
BH SBC009	03/03/2021	7.50									Driller notes borehole making water.
BH SBC010A	23/02/2021	4.30	3.70		2.65	20	3.10	2.90	2.75	2.65	Water strike.
BH SBC010A	24/02/2021	6.00									Artesian water conditions encountered overnight. Water level at 0.40m AGL at the start of day on 24/02/2021.
BH SBC014A	09/03/2021	19.50									Water strike (heavy inflow).
BH SBC022	11/03/2021	5.20	5.00								Water strike (moderate inflow).
BH SBC023A	03/03/2021	7.40									Water strikes between 7.40-7.80m BGL.
BH SBC024	11/03/2021	16.10									Water strike (moderate inflow).
BH SBC025	05/03/2021	1.30			1.20	20	1.30	1.25	1.22	1.20	Water strike.
BH SBC025	09/03/2021	15.10									Water strike (moderate inflow).



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No :-

4322A

Date of Issue :-

26/08/2021

Page No. :-

1 of 2

Checked By :-



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GWOWS/4322A/1



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (WATER STRIKES)

Exploratory Hole No.	Date	Depth of Water (m)	Depth of Casing (m)	Depth Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
BH SBC029	03/03/2021	3.50	3.50		2.61	20	2.54	2.51	2.56	2.61	Water strike (slow inflow).
BH SBC030	04/03/2021	5.00	4.80		3.64	20	4.76	4.24	3.87	3.64	Water strike (slow inflow).
TP SBC009	22/02/2021	3.60			3.40	20				3.40	Water strike.
TP SBC014	24/02/2021	1.00									Water strike.
TP SBC036	05/03/2021	3.00									Water strike.



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No :-

4322A

Date of Issue :-

26/08/2021

Page No. :-

2 of 2

Checked By :-



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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (GROUNDWATER SEEPAGES)

Monitoring Point	Date	Depth (m)	Remarks
BH SBC012	01/03/2021	7.60	Slight water seepage.
TP SBC004	26/02/2021	1.60	Slight water seepage.
TP SBC006	23/02/2021	1.00	Water seepages between 1.00-2.80m BGL.
TP SBC008	23/02/2021	3.00	Water seepage.
TP SBC012A	24/02/2021	2.50	Water seepages between 2.50-2.80m BGL.
TP SBC013	03/02/2021	1.90	Slight water seepage.
TP SBC016	04/03/2021	4.47	Water seepage (from soakaway test).
TP SBC017	01/03/2021	0.70	Water seepages between 0.70-1.10m BGL.
TP SBC021	02/03/2021	2.60	Water seepages between 2.60-2.80m BGL.
TP SBC022	04/03/2021	1.50	Water seepage.
TP SBC023	03/02/2021	2.00	Slow water seepage.
TP SBC024	24/02/2021	4.50	Water seepage.
TP SBC026	24/02/2021	3.90	Water seepage.
TP SBC031	26/02/2021	4.50	Water seepage in base of pit.
TP SBC042	03/03/2021	3.80	Water seepage.
TP SBC044	08/03/2021	2.40	Slight water seepage.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWOS/4322A/1	Date of Issue :- 26/08/2021	Page No. :- 1 of 1	
	Checked By :- 	Approved By :- 	AEG Contract No. :- 4322A	



## Groundwater Monitoring Results







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC001	31/03/2021 13:37	2.00m 19mm SPIE	158.63	Dry		Possible kink/blockage in pipe - Unable to measure water level past approx. 1.55m BGL.
BH SBC001	09/04/2021 15:45	2.00m 19mm SPIE	158.63	Dry		Possible kink/blockage in pipe - Unable to measure water level past approx. 1.55m BGL.
BH SBC001	23/04/2021 13:07	2.00m 19mm SPIE	158.63	Dry		Possible kink/blockage in pipe - Unable to measure water level past approx. 1.55m BGL.
BH SBC001	30/04/2021 13:50	2.00m 19mm SPIE	158.63	Dry		Possible kink/blockage in pipe - Unable to measure water level past approx. 1.55m BGL.
BH SBC001	05/05/2021 12:04	2.00m 19mm SPIE	158.63	Dry		Possible kink/blockage in pipe - Unable to measure water level past approx. 1.55m BGL.
BH SBC001	26/08/2021 11:51	2.00m 19mm SPIE	158.63			Unable to locate.
BH SBC002	31/03/2021 13:04	4.00m 19mm SPIE	166.93	2.86	164.07	
BH SBC002	09/04/2021 15:16	4.00m 19mm SPIE	166.93	2.92	164.01	
BH SBC002	23/04/2021 14:10	4.00m 19mm SPIE	166.93	1.84	165.09	
BH SBC002	30/04/2021 15:26	4.00m 19mm SPIE	166.93	1.62	165.31	
BH SBC002	05/05/2021 12:19	4.00m 19mm SPIE	166.93	1.66	165.27	
BH SBC002	26/08/2021 12:26	4.00m 19mm SPIE	166.93	2.11	164.82	
BH SBC005	31/03/2021 12:55	3.00m 19mm SPIE	178.74	1.54	177.20	
BH SBC005	09/04/2021 14:57	3.00m 19mm SPIE	178.74	1.81	176.93	
BH SBC005	23/04/2021 13:58	3.00m 19mm SPIE	178.74	2.17	176.57	
BH SBC005	30/04/2021 15:12	3.00m 19mm SPIE	178.74	2.26	176.48	
BH SBC005	05/05/2021 12:25	3.00m 19mm SPIE	178.74	2.21	176.53	
BH SBC005	26/08/2021 12:12	3.00m 19mm SPIE	178.74	Dry		
BH SBC006	29/03/2021 12:12	7.00m 50mm SP	179.72	3.67	176.05	
BH SBC006	31/03/2021 12:45	7.00m 50mm SP	179.72	3.74	175.98	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9		Client :- AMEY OW Limited	
	Certificate No. :- GWMR/4322A/1	Date of Issue :- 08/09/2021	Page No. :- 1 of 8
	Checked By :- [Redacted]	Approved By :- [Redacted]	AEG Contract No. :- 4322A



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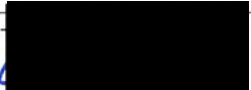

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC006	09/04/2021 14:40	7.00m 50mm SP	179.72	3.89	175.83	
BH SBC006	23/04/2021 13:52	7.00m 50mm SP	179.72	4.13	175.59	
BH SBC006	30/04/2021 15:03	7.00m 50mm SP	179.72	4.14	175.58	
BH SBC006	05/05/2021 12:32	7.00m 50mm SP	179.72	4.26	175.46	
BH SBC006	26/08/2021 12:08	7.00m 50mm SP	179.72	4.42	175.30	
BH SBC008	29/03/2021 11:10	4.00m 50mm SP	172.44	1.10	171.34	
BH SBC008	31/03/2021 12:24	4.00m 50mm SP	172.44	1.10	171.34	
BH SBC008	09/04/2021 14:07	4.00m 50mm SP	172.44	0.78	171.66	
BH SBC008	23/04/2021 13:41	4.00m 50mm SP	172.44	1.32	171.12	
BH SBC008	30/04/2021 14:40	4.00m 50mm SP	172.44	1.23	171.21	
BH SBC008	05/05/2021 12:45	4.00m 50mm SP	172.44	1.18	171.26	
BH SBC008	26/08/2021 12:02	4.00m 50mm SP	172.44	1.70	170.74	
BH SBC009	31/03/2021 12:32	5.00m 19mm SPIE	173.52	2.02	171.50	
BH SBC009	09/04/2021 14:21	5.00m 19mm SPIE	173.52	1.20	172.32	
BH SBC009	23/04/2021 13:45	5.00m 19mm SPIE	173.52	1.47	172.05	
BH SBC009	30/04/2021 14:50	5.00m 19mm SPIE	173.52	1.62	171.90	
BH SBC009	05/05/2021 12:40	5.00m 19mm SPIE	173.52	1.52	172.00	
BH SBC009	26/08/2021 13:20	5.00m 19mm SPIE	173.52	2.26	171.26	
BH SBC011	31/03/2021 11:56	2.50m 19mm SPIE	169.01	0.75	168.26	
BH SBC011	09/04/2021 13:24	2.50m 19mm SPIE	169.01	0.79	168.22	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/2	Date of Issue :- 08/09/2021	Page No. :- 2 of 8
	Checked By :- 	Approved By :- 	AEG Contract No. :- 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC011	23/04/2021 13:26	2.50m 19mm SPIE	169.01	0.92	168.09	
BH SBC011	30/04/2021 14:18	2.50m 19mm SPIE	169.01	0.84	168.17	
BH SBC011	05/05/2021 13:01	2.50m 19mm SPIE	169.01	0.98	168.03	
BH SBC011	26/08/2021 00:00	2.50m 19mm SPIE	169.01			Unable to locate.
BH SBC013	01/04/2021 16:17	8.00m 19mm SPIE	163.63	5.13	158.50	
BH SBC013	09/04/2021 12:56	8.00m 19mm SPIE	163.63	5.40	158.23	
BH SBC013	23/04/2021 12:53	8.00m 19mm SPIE	163.63	5.63	158.00	
BH SBC013	30/04/2021 13:19	8.00m 19mm SPIE	163.63	5.71	157.92	
BH SBC013	05/05/2021 13:24	8.00m 19mm SPIE	163.63	5.74	157.89	
BH SBC013	26/08/2021 09:56	8.00m 19mm SPIE	163.63	5.66	157.97	
BH SBC014A	31/03/2021 11:11	14.00m 19mm SPIE	158.93	Dry		
BH SBC014A	09/04/2021 12:31	14.00m 19mm SPIE	158.93	6.47	152.46	
BH SBC014A	23/04/2021 12:40	14.00m 19mm SPIE	158.93	6.59	152.34	
BH SBC014A	30/04/2021 13:10	14.00m 19mm SPIE	158.93	6.54	152.39	
BH SBC014A	05/05/2021 13:30	14.00m 19mm SPIE	158.93	6.50	152.43	
BH SBC014A	26/08/2021 13:48	14.00m 19mm SPIE	158.93	7.30	151.63	
BH SBC016	31/03/2021 10:26	5.00m 19mm SPIE	158.13	0.49	157.64	
BH SBC016	09/04/2021 12:09	5.00m 19mm SPIE	158.13	0.68	157.45	
BH SBC016	23/04/2021 12:30	5.00m 19mm SPIE	158.13	0.82	157.31	
BH SBC016	30/04/2021 12:55	5.00m 19mm SPIE	158.13	0.96	157.17	

SP = Standpipe - SPIE = Standpipe Piezometer

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/3	Date of Issue :- 08/09/2021	Page No. :- 3 of 8
	Checked By :- <span style="background-color: black; color: black;">[REDACTED]</span>	Approved By :- <span style="background-color: black; color: black;">[REDACTED]</span>	AEG Contract No. :- 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC016	05/05/2021 13:36	5.00m 19mm SPIE	158.13	1.01	157.12	
BH SBC016	26/08/2021 13:30	5.00m 19mm SPIE	158.13	1.26	156.87	
BH SBC017	31/03/2021 10:38	3.00m 19mm SPIE	151.48	0.85	150.63	
BH SBC017	09/04/2021 12:00	3.00m 19mm SPIE	151.48	0.93	150.55	
BH SBC017	23/04/2021 12:22	3.00m 19mm SPIE	151.48	1.07	150.41	
BH SBC017	30/04/2021 12:46	3.00m 19mm SPIE	151.48	1.02	150.46	
BH SBC017	05/05/2021 13:45	3.00m 19mm SPIE	151.48	1.07	150.41	
BH SBC017	26/08/2021 14:03	3.00m 19mm SPIE	151.48	1.40	150.08	
BH SBC018	31/03/2021 10:55	2.50m 19mm SPIE	153.64	0.72	152.92	
BH SBC018	09/04/2021 11:38	2.50m 19mm SPIE	153.64	0.72	152.92	
BH SBC018	23/04/2021 12:12	2.50m 19mm SPIE	153.64	0.97	152.67	
BH SBC018	30/04/2021 11:57	2.50m 19mm SPIE	153.64	0.87	152.77	
BH SBC018	05/05/2021 13:59	2.50m 19mm SPIE	153.64	0.90	152.74	
BH SBC018	26/08/2021 14:26	2.50m 19mm SPIE	153.64	1.48	152.16	
BH SBC019	31/03/2021 09:39	3.50m 19mm SPIE	141.62	0.80	140.82	
BH SBC019	09/04/2021 10:31	3.50m 19mm SPIE	141.62	1.33	140.29	
BH SBC019	23/04/2021 11:37	3.50m 19mm SPIE	141.62	1.27	140.35	
BH SBC019	30/04/2021 11:25	3.50m 19mm SPIE	141.62	0.86	140.76	
BH SBC019	05/05/2021 14:22	3.50m 19mm SPIE	141.62	0.84	140.78	
BH SBC019	26/08/2021 14:41	3.50m 19mm SPIE	141.62	1.19	140.43	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/4	Date of Issue :- 08/09/2021	Page No. :- 4 of 8
	Checked By :- [Redacted]	Approved By :- [Redacted]	AEG Contract No. :- 4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC020	31/03/2021 09:27	5.50m 19mm SPIE	148.39	1.41	146.98	
BH SBC020	09/04/2021 10:40	5.50m 19mm SPIE	148.39	1.44	146.95	
BH SBC020	23/04/2021 11:04	5.50m 19mm SPIE	148.39	1.81	146.58	
BH SBC020	30/04/2021 11:10	5.50m 19mm SPIE	148.39	1.76	146.63	
BH SBC020	05/05/2021 14:32	5.50m 19mm SPIE	148.39	1.78	146.61	
BH SBC020	26/08/2021 14:35	5.50m 19mm SPIE	148.39	2.25	146.14	
BH SBC021	31/03/2021 09:20	2.50m 19mm SPIE	148.44	0.69	147.75	
BH SBC021	09/04/2021 10:54	2.50m 19mm SPIE	148.44	0.71	147.73	
BH SBC021	23/04/2021 10:47	2.50m 19mm SPIE	148.44	0.93	147.51	
BH SBC021	30/04/2021 10:58	2.50m 19mm SPIE	148.44	0.85	147.59	
BH SBC021	05/05/2021 14:37	2.50m 19mm SPIE	148.44	0.82	147.62	
BH SBC021	26/08/2021 14:32	2.50m 19mm SPIE	148.44	1.04	147.40	
BH SBC022	31/03/2021 10:04	1.50m 19mm SPIE	146.03	0.63	145.40	
BH SBC022	09/04/2021 11:05	1.50m 19mm SPIE	146.03	0.66	145.37	
BH SBC022	23/04/2021 10:35	1.50m 19mm SPIE	146.03	0.74	145.29	
BH SBC022	30/04/2021 10:45	1.50m 19mm SPIE	146.03	0.72	145.31	
BH SBC022	05/05/2021 14:51	1.50m 19mm SPIE	146.03	0.70	145.33	
BH SBC022	26/08/2021 14:29	1.50m 19mm SPIE	146.03	0.81	145.22	
BH SBC023A	31/03/2021 08:50	8.50m 19mm SPIE	145.36	6.39	138.97	
BH SBC023A	09/04/2021 10:10	8.50m 19mm SPIE	145.36	4.34	141.02	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/5	Date of Issue :- 08/09/2021	Page No. :- 5 of 8
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BHSBC023A	23/04/2021 10:05	8.50m 19mm SPIE	145.36	2.83	142.53	
BHSBC023A	30/04/2021 10:10	8.50m 19mm SPIE	145.36	2.47	142.89	
BHSBC023A	05/05/2021 15:49	8.50m 19mm SPIE	145.36	2.27	143.09	
BHSBC023A	26/08/2021 14:55	8.50m 19mm SPIE	145.36	2.02	143.34	
BHSBC024	31/03/2021 10:10	15.00m 19mm SPIE	145.90	5.93	139.97	
BHSBC024	09/04/2021 11:12	15.00m 19mm SPIE	145.90	3.71	142.19	
BHSBC024	23/04/2021 10:24	15.00m 19mm SPIE	145.90	2.41	143.49	
BHSBC024	30/04/2021 10:37	15.00m 19mm SPIE	145.90	2.24	143.66	
BHSBC024	05/05/2021 15:03	15.00m 19mm SPIE	145.90	2.13	143.77	
BHSBC024	26/08/2021 14:26	15.00m 19mm SPIE	145.90	1.76	144.14	
BHSBC025	31/03/2021 08:42	4.00m 19mm SPIE	142.97	1.77	141.20	
BHSBC025	09/04/2021 10:00	4.00m 19mm SPIE	142.97	1.82	141.15	
BHSBC025	23/04/2021 09:50	4.00m 19mm SPIE	142.97	1.67	141.30	
BHSBC025	30/04/2021 09:59	4.00m 19mm SPIE	142.97	1.90	141.07	
BHSBC025	05/05/2021 15:40	4.00m 19mm SPIE	142.97	1.85	141.12	
BHSBC025	26/08/2021 15:05	4.00m 19mm SPIE	142.97	2.07	140.90	
BHSBC026	31/03/2021 09:03	4.50m 19mm SPIE	143.64	1.05	142.59	
BHSBC026	09/04/2021 09:47	4.50m 19mm SPIE	143.64	1.12	142.52	
BHSBC026	23/04/2021 09:27	4.50m 19mm SPIE	143.64	1.25	142.39	
BHSBC026	30/04/2021 09:41	4.50m 19mm SPIE	143.64	1.23	142.41	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/6	Date of Issue :- 08/09/2021	Page No. :- 6 of 8
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC026	05/05/2021 15:28	4.50m 19mm SPIE	143.64	1.05	142.59	
BH SBC026	26/08/2021 00:00	4.50m 19mm SPIE	143.64			Unable to locate.
BH SBC027	31/03/2021 08:32	2.50m 19mm SPIE	141.96	0.90	141.06	
BH SBC027	09/04/2021 09:54	2.50m 19mm SPIE	141.96	0.87	141.09	
BH SBC027	23/04/2021 09:38	2.50m 19mm SPIE	141.96	0.85	141.11	
BH SBC027	30/04/2021 09:49	2.50m 19mm SPIE	141.96	0.89	141.07	
BH SBC027	05/05/2021 15:34	2.50m 19mm SPIE	141.96	0.97	140.99	
BH SBC027	26/08/2021 15:01	2.50m 19mm SPIE	141.96	1.12	140.84	
BH SBC029	01/04/2021 15:22	4.50m 19mm SPIE	150.17	1.17	149.00	
BH SBC029	09/04/2021 09:25	4.50m 19mm SPIE	150.17	1.36	148.81	
BH SBC029	23/04/2021 16:20	4.50m 19mm SPIE	150.17	1.32	148.85	
BH SBC029	30/04/2021 15:55	4.50m 19mm SPIE	150.17	1.18	148.99	
BH SBC029	05/05/2021 16:07	4.50m 19mm SPIE	150.17	1.20	148.97	
BH SBC029	26/08/2021 15:32	4.50m 19mm SPIE	150.17	1.13	149.04	
BH SBC030	01/04/2021 15:36	3.00m 19mm SPIE	150.26	0.41	149.85	
BH SBC030	09/04/2021 09:14	3.00m 19mm SPIE	150.26	0.45	149.81	
BH SBC030	23/04/2021 16:30	3.00m 19mm SPIE	150.26	0.56	149.70	
BH SBC030	30/04/2021 16:00	3.00m 19mm SPIE	150.26	0.60	149.66	
BH SBC030	05/05/2021 16:12	3.00m 19mm SPIE	150.26	0.58	149.68	
BH SBC030	26/08/2021 15:37	3.00m 19mm SPIE	150.26	0.94	149.32	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/7	Date of Issue :- 08/09/2021	Page No. :- 7 of 8
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED



Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH SBC031	01/04/2021 15:54	6.50m 19mm SPIE	155.63	6.01	149.62	
BH SBC031	09/04/2021 08:58	6.50m 19mm SPIE	155.63	6.05	149.58	
BH SBC031	23/04/2021 09:10	6.50m 19mm SPIE	155.63	6.05	149.58	
BH SBC031	30/04/2021 09:10	6.50m 19mm SPIE	155.63	5.97	149.66	
BH SBC031	05/05/2021 16:33	6.50m 19mm SPIE	155.63	5.94	149.69	
BH SBC031	26/08/2021 09:06	6.50m 19mm SPIE	155.63	5.87	149.76	
BH SBC032A	29/03/2021 13:06	7.00m 19mm SPIE	147.47	6.09	141.38	
BH SBC032A	09/04/2021 08:39	7.00m 19mm SPIE	147.47	5.70	141.77	
BH SBC032A	23/04/2021 08:49	7.00m 19mm SPIE	147.47	4.61	142.86	
BH SBC032A	30/04/2021 08:44	7.00m 19mm SPIE	147.47	4.21	143.26	
BH SBC032A	05/05/2021 16:26	7.00m 19mm SPIE	147.47	3.61	143.86	
BH SBC032A	26/08/2021 08:58	7.00m 19mm SPIE	147.47	1.34	146.13	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Certificate No. :- GWMR/4322A/8	Date of Issue :- 08/09/2021	Page No. :- 8 of 8	
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*In-situ* Test Report Certificate





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - [REDACTED]



## IN-SITU TESTING REPORT CERTIFICATE



**Contract Title:** A66 North Trans Pennine Scheme C Section 9    **AEG Reference:** 4322A

**Client Address:** AMEY OW Limited  
Chancery Exchange  
10 Furnival Street  
London  
EC4A 1AB

I certify that *In-situ* testing was carried out on the above contract in accordance with techniques outlined in BS 1377: 1990: Part 9 or other appropriate standards as quoted, and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Managing Director)
- Kerry Wade (Technical Manager)

Signed \_\_\_\_\_

Date: 08 September 2021

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation



# IN-SITU TESTING REPORT CERTIFICATE

## ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Test Report Certificate	N/A		2
1	Standard Penetration Test Results (SPT)	Yes	BS 1377 Part 9 1990	57
2	Hand Shear Vane Test Results	No		6
3	Variable Head Permeability Test Results	No	BS 5930 1999:Section 4	14
4	<i>In-situ</i> Water Quality Parameter Test Results	No		1
5	Photo-ionisation Detector Test Results	No		2
6	Determination of the Soil Infiltration Rate for Soakaway Design	No	BRE Digest 365:1991	9
7	Plate Loading Test Results	No	BS 1377 Part 9 1990	6
-	Density by Core Cutter Method	Yes	BS 1377 Part 9 1990	-
-	Determination of the Vane Shear Strength (Down the Hole)	Yes	BS 1377 Part 9 1990	-
-	Shallow Pad (skip) Load Test Results	No	BS 1377 Part 9 1990	-
-	Determination of the California Bearing Ratio	Yes	BS 1377 Part 9 1990	-
-	Apparent Resistivity of Soil	No	BS 1377 Part 9 1990	-
-	Redox Potential of Soil	No	BS 1377 Part 9 1990	-



**Standard Penetration Test Results**





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RU  
Regional Office: Unit 20 Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio $E_m$	SEATING DRIVE						TEST DRIVE						Energy Ratio Corr. $C_r$	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) $N_{60}$	Shoe or Cone	Remarks		
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows							Total Pen	Total Blows
BH SBC001	1.20 (157.43)	Dry (1.00)	1.20	ATH07	54	75	25	20	25	2	75	2	150	95	50	60	100	60	100	0.90	0.60	-	-	S	
BH SBC001	8.50 (150.13)	4.35 (2.70)	8.50	R07	63	20	25						20	25	25	0	50	0	50	1.05	0.00	-	-	C	
BH SBC002	1.50 (165.43)	Dry (1.50)	1.50	ATH06	51	75	2	75	2	75	2	150	150	4	75	3	5	75	5	0.85	17.65	17	10	S	
BH SBC002	3.50 (163.43)	Wet (3.50)	3.50	ATH06	51	75	3	75	4	75	4	150	150	7	75	5	4	75	4	0.85	15.79	19	12	C	
BH SBC002	4.50 (162.43)	Wet (4.50)	4.50	ATH06	51	75	2	75	2	75	2	150	150	4	75	3	3	75	3	0.85	27.27	11	7	C	
BH SBC002	5.50 (161.43)	Wet (5.50)	5.50	ATH06	51	75	2	75	4	75	4	150	150	6	75	4	4	75	4	0.85	21.43	14	10	C	
BH SBC005	1.20 (177.54)	Dry (1.00)	1.20	ATH07	54	75	2	75	2	75	2	150	150	4	75	3	8	75	6	0.90	13.64	22	13	S	
BH SBC005	2.50 (176.24)	Dry (2.50)	2.50	ATH07	54	75	4	75	4	75	4	150	150	8	75	3	4	75	5	0.90	17.65	17	11	S	
BH SBC005	4.00 (174.74)	3.14 (3.80)	4.00	ATH07	54	75	5	75	7	75	7	150	150	12	75	6	8	75	11	0.90	7.89	38	26	S	
BH SBC005	5.00 (173.74)	3.83 (4.80)	5.00	ATH07	54	75	6	75	8	75	8	150	150	14	75	10	14	75	20	0.90	4.17	72	52	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No :-

4322A

Date of Issue :-

26/08/2021

Page No. :-

1 of 19

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Approved By

Certificate No. :-

SPT/4322A/1



1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED


Head Office: Unit 25 Stella Gill Industrial Estate, Peaton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>m</sub> %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>R</sub>	Energy Ratio Corr. C <sub>E</sub>	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks
						Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows							
BH SBC006	1.20 (178.52)	Dry (1.00)	1.20	ATH07	54	2	75	3	150	5	75	3	75	3	75	3	75	3	300	12	25.00	7	S	
BH SBC006	2.50 (177.22)	Dry (2.30)	2.50	ATH07	54	2	75	3	150	5	75	3	75	3	75	3	75	3	300	54	5.56	34	S	
BH SBC006	3.50 (176.22)	Dry (3.30)	3.50	ATH07	54	4	75	5	150	9	75	5	75	6	75	6	75	6	300	22	13.64	15	S	
BH SBC006	4.50 (175.22)	Dry (4.30)	4.50	ATH07	54	15	75	20	150	35	75	56	35	44	75	4	75	4	110	100	1.10	-	S	
BH SBC007	1.20 (179.59)	Dry (1.00)	1.20	ATH07	54	2	75	2	150	4	75	3	75	3	75	4	75	4	300	15	20.00	9	S	
BH SBC007	2.00 (178.79)	Dry (1.80)	2.00	ATH07	54	3	75	5	150	8	75	7	75	9	75	12	75	12	300	46	6.52	28	S	
BH SBC007	3.00 (177.79)	1.54 (2.80)	3.00	ATH07	54	5	75	9	150	14	75	13	75	17	75	19	75	21	300	70	4.29	45	S	
BH SBC008	1.20 (171.24)	Damp (1.00)	1.20	ATH07	54	2	75	3	150	5	75	5	75	6	75	3	75	7	300	21	14.29	12	S	
BH SBC008	2.50 (169.94)	Damp (2.30)	2.50	ATH07	54	4	75	6	150	10	75	9	75	13	75	11	75	12	300	45	6.67	28	S	
BH SBC008	4.00 (168.44)	2.42 (3.80)	4.00	ATH07	54	3	75	7	150	10	75	11	75	13	75	15	75	25	300	64	4.69	44	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Client :- AMEY OW Limited		AEG Contract No. :- 4322A	
	Date of Issue :- 26/08/2021		Checked :- [Redacted]		Certificate No. :- SPT/4322A/2	
Page No. :- 2 of 19		Approved By :- [Redacted]		1367		



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Felton Fall, Cheshire Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio $E_p$	SEATING DRIVE						TEST DRIVE						Rod Length Corr. $C_R$	Energy Ratio Corr. $C_E$	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) $N_{60}$	Shoe or Cone	Remarks											
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows	Pen	Blows	Total Pen	Total Blows					
BH SBC008	4.50 (167.94)	2.56 (4.30)	4.50	ATH07	54	75	18	75	22	150	40	75	36	75	36	75	36	75	36	75	36	75	36	75	185	100	185	100	0.78	0.90	1.85	-	-	S	
BH SBC009	1.20 (172.32)	Dry (1.00)	1.20	ATH07	54	75	2	75	3	150	5	75	11	75	13	75	13	75	4	75	4	75	4	75	300	32	300	32	0.65	0.90	9.38	19	19	S	
BH SBC009	2.00 (171.52)	Dry (1.80)	2.00	ATH07	54	75	4	75	8	150	12	75	10	75	14	75	14	75	13	75	13	75	12	300	49	300	49	0.68	0.90	6.12	49	30	S		
BH SBC009	3.00 (170.52)	1.66 (2.80)	3.00	ATH07	54	75	15	75	19	150	34	75	24	75	28	75	28	75	32	75	32	75	16	280	100	280	100	0.72	0.90	2.80	-	-	S		
BH SBC009	4.00 (169.52)	Dry (3.80)	4.00	ATH07	54	75	11	75	14	150	25	75	18	75	20	75	20	75	33	75	33	75	29	280	100	280	100	0.76	0.90	2.80	-	-	S		
BH SBC009	5.00 (168.52)	Dry (4.50)	5.00	ATH05	59	75	11	75	14	150	25	75	15	75	14	75	14	75	14	75	14	75	16	300	59	300	59	0.80	0.98	5.08	46	46	S		
BH SBC009	5.50 (168.02)	Dry (4.50)	5.50	ATH05	59	75	21	75	24	150	45	75	47	75	50	75	50	75	50	75	50	75	47	47	50	47	50	0.82	0.98	0.94	-	-	S		
BH SBC010	2.30 (169.41)	Dry (2.20)	2.30	TO2	53	75	2	75	6	150	8	75	5	75	5	75	5	75	5	75	5	75	7	300	22	300	22	0.69	0.88	13.64	22	13	S		
BH SBC010A	3.70 (168.01)	Dry (3.70)	3.70	TO2	53	75	3	75	3	150	6	75	3	75	3	75	5	75	6	75	6	75	6	300	20	300	20	0.75	0.88	15.00	20	13	S		
BH SBC010A	4.70 (167.01)	2.70 (4.70)	4.70	TO2	53	75	3	75	2	150	5	75	3	75	5	75	5	75	4	75	4	75	6	300	18	300	18	0.79	0.88	16.67	18	13	S		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No. :-

4322A

Date of Issue :-

26/08/2021

Page No. :-

3 of 19

Checked By

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Certificate No. :-

SPT/4322A/3





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>h</sub> %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>R</sub>	Energy Ratio Corr. C <sub>E</sub>	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks					
						Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows								Pen mm	Blows	Total Pen mm	Total Blows	
BH SBC010A	5.70 (166.01)	0.30 (5.70)	5.70	T02	53	75	6	75	8	150	14	75	12	75	21	55	17	75	5	300	205	50	0.83	0.88	4.10	-	-	S	
BH SBC011	2.30 (166.71)	Dry (2.20)	2.30	T02	53	75	6	75	13	150	19	75	26	75	4	75	4	75	5	300	399	39	0.69	0.88	7.69	24		S	
BH SBC011	4.30 (164.71)	Dry (4.20)	4.30	T02	53	75	2	75	3	150	5	75	3	75	6	75	6	75	11	300	26	18	0.77	0.88	11.54	26		S	
BH SBC011	7.50 (161.51)	Dry (6.00)	7.50	T02	53	75	5	75	19	150	24	75	10	75	15	75	10	75	12	300	47	37	0.90	0.88	6.38	47		S	
BH SBC012	2.30 (167.03)	Dry (2.20)	2.30	T02	53	75	3	75	2	150	5	75	4	75	4	75	5	75	8	300	21	13	0.69	0.88	14.29	21		S	
BH SBC012	4.20 (165.13)	Damp (4.10)	4.20	T02	53	75	11	75	10	150	21	75	5	75	7	75	7	75	7	300	26	18	0.77	0.88	11.54	26		S	
BH SBC012	7.60 (161.73)	Dry (7.30)	7.60	T02	53	75	22	5	3	80	25	75	12	75	8	75	6	75	5	300	31	25	0.90	0.88	9.68	31		S	
BH SBC012	10.40 (158.93)	Dry (7.60)	10.40	T02	53	75	7	75	12	150	19	75	3	75	3	75	4	75	4	300	14	12	1.00	0.88	21.43	14		S	
BH SBC013	2.50 (161.13)	Dry (2.50)	2.50	ATH06	51	75	2	75	4	150	6	75	7	75	7	75	6	75	6	300	26	15	0.70	0.85	11.54	26		S	
BH SBC013	4.50 (159.13)	Dry (4.50)	4.50	ATH06	51	75	3	75	4	150	7	75	4	75	5	75	7	75	7	300	23	15	0.78	0.85	13.04	23		S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No. :-

4322A

Date of Issue :-

26/08/2021

Page No. :-

4 of 19

Checked By

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SPT/4322A/4






# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Peilow Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. $C_R$	Energy Ratio Corr. $C_E$	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr. No)	Shoe or Cone		Remarks				
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows						Total Pen	Total Blows		S/C	S		
BH SBC013	7.00 (156.63)	Dry (7.00)	7.00	ATH06	51	75	4	75	5	150	9	75	8	75	8	75	9	75	9	300	34	0.88	0.85	8.82	34	25	S	S	
BH SBC013	10.00 (153.63)	Dry (10.00)	10.00	ATH06	51	75	6	75	6	150	12	75	7	75	8	75	10	75	12	300	37	1.00	0.85	8.11	37	31	S	S	
BH SBC014A	2.50 (156.43)	Dry (2.50)	2.50	ATH06	51	75	3	75	3	150	6	75	4	75	3	75	5	75	5	300	17	0.70	0.85	17.65	17	10	S	S	
BH SBC014A	4.50 (154.43)	Dry (4.50)	4.50	ATH06	51	75	3	75	4	150	7	75	4	75	6	75	8	75	7	300	25	0.78	0.85	12.00	25	17	S	S	
BH SBC014A	7.00 (151.93)	Dry (7.00)	7.00	ATH06	51	75	3	75	3	150	6	75	3	75	4	75	5	75	5	300	17	0.88	0.85	17.65	17	13	S	S	
BH SBC014A	8.60 (150.33)	Dry (7.10)	8.60	R07	63	75	3	75	7	150	10	75	9	75	7	75	9	75	9	300	34	0.94	1.05	8.82	34	34	S	S	
BH SBC014A	10.10 (148.83)	Dry (7.10)	10.10	R07	63	75	5	75	8	150	13	75	10	75	9	75	9	75	13	300	41	1.00	1.05	7.32	41	43	S	S	
BH SBC014A	11.60 (147.33)	Dry (7.10)	11.60	R07	63	75	1	75	4	150	5	75	11	75	10	75	9	75	8	300	38	1.00	1.05	7.89	38	40	S	S	
BH SBC014A	13.10 (145.83)	Dry (11.30)	13.10	R07	63	75	3	75	5	150	8	75	59	75								1.00	1.05	1.27	-	-	S	S	
BH SBC014A	15.10 (143.83)	Dry (13.00)	15.10	R07	63	75	6	75	9	150	15	75	13	75	21	20	16					1.00	1.05	3.40	-	-	S	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	Client :-	AMEY OW Limited	AEG Contract No :-	4322A
	Date of Issue :-	26/08/2021	Approved By :-	[Redacted]	Certificate No. :-	SPT/4322A/5
	Page No. :-	5 of 19	Checked By :-	[Redacted]		



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chestle-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Enam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E <sub>1</sub>	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>R</sub>	Energy Ratio Corr. C <sub>E</sub>	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks	
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen
BH-SBC014A	16.80 (142.13)	Dry (15.00)	16.80	R07	63	75	9	75	15	150	24	75	15	75	14	75	17	75	17	225	46	4.89	-	S	
BH-SBC014A	18.30 (140.63)	15.10 (16.00)	18.30	R07	63	75	11	75	9	150	20	75	13	75	13	75	14	75	10	300	50	6.00	53	S	
BH-SBC014A	19.30 (139.63)	15.85 (16.00)	19.30	R07	63	75	8	75	10	150	18	75	15	75	21	75	27	75	27	225	63	3.57	-	S	
BH-SBC014A	22.80 (136.13)	17.35 (16.00)	22.80	R07	63	75	19	75	28	75	19	75	28	25	22					100	50	2.00	-	C	
BH-SBC015	1.50 (155.29)	Wet (1.50)	1.50	ATH06	51	75	2	75	2	150	4	75	3	75	2	75	3	75	4	300	12	25.00	7	S	
BH-SBC015	2.50 (154.29)	Wet (2.50)	2.50	ATH06	51	75	3	75	5	150	8	75	3	75	3	75	4	75	5	300	15	20.00	9	S	
BH-SBC015	4.50 (152.29)	Dry (4.50)	4.50	ATH06	51	75	4	75	4	150	8	75	6	75	5	75	5	75	6	300	22	13.64	15	S	
BH-SBC015	5.50 (151.29)	2.80 (5.50)	5.50	ATH06	51	75	3	75	4	150	7	75	4	75	6	75	6	75	6	300	22	13.64	15	S	
BH-SBC015	8.50 (148.29)	2.80 (8.50)	8.50	ATH06	51	75	3	75	4	150	7	75	7	75	8	75	8	75	10	300	33	9.09	26	S	
BH-SBC015	11.50 (145.29)	Dry (10.50)	11.50	ATH06	51	75	4	75	4	150	8	75	5	75	5	75	5	75	7	300	22	13.64	19	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No. :- 4322A

Date of Issue :- 26/08/2021

Page No. :- 6 of 19

Checked

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Certificate No. :- SPT/4322A/6



1367




# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>s</sub> %	SEATING DRIVE										TEST DRIVE										Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) No.	Shoe or Cone	Remarks																				
						Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Total Pen mm	Total Blows							Rod Length Corr. C <sub>r</sub>																			
BH-SBC015	13.00 (143.79)	Dry (13.00)	13.00	ATH06	51	75	4	75	5	150	9	75	19	21	24		75	7	75	7	75	19	21	24		75	7	75	5	150	9	75	19	21	24		171	50	1.00	0.85	3.42	-	S								
BH-SBC015	14.50 (142.29)	Dry (14.50)	14.50	ATH06	51	75	7	75	7	150	14	75	9	75	12		75	8	75	8	75	9	75	12		75	15	300	44	1.00	0.85	6.82	37	S																	
BH-SBC015	16.00 (140.79)	11.00 (16.00)	16.00	ATH06	51	75	7	75	8	150	15	75	10	75	10		75	8	75	8	75	10	75	10		75	12	300	40	1.00	0.85	7.50	34	S																	
BH-SBC015	17.50 (139.29)	14.20 (17.50)	17.50	ATH06	51	75	7	75	8	150	15	75	10	75	24		75	10	75	10	75	10	75	24		75	6	225	50	1.00	0.85	4.50	-	S																	
BH-SBC015	18.00 (138.79)	16.30 (18.00)	18.00	ATH06	51	68	25			68	25	31	50															31	50	1.00	0.85	0.62	-	S																	
BH-SBC015	19.00 (137.79)	8.67 (18.00)	19.00	ATH05	59	47	50			47	50																			1.00	0.98	-	-	C																	
BH-SBC015	20.00 (136.79)	9.06 (18.00)	20.00	ATH05	59	75	14	75	16	150	30	75	10	75	12		75	10	75	10	75	10	75	12		75	10	300	42	1.00	0.98	7.14	41	C																	
BH-SBC015	21.00 (135.79)	10.49 (21.00)	21.00	ATH05	59	75	14	75	13	150	27	75	9	75	14		75	11	75	11	75	11	75	14		75	16	300	50	1.00	0.98	6.00	49	C																	
BH-SBC015	22.00 (134.79)	8.76 (21.00)	22.00	ATH05	59	75	6	75	7	150	13	75	7	75	7		75	8	75	7	75	8	75	7		75	6	300	28	1.00	0.98	10.71	27	C																	
BH-SBC016	1.50 (156.63)	Dry (1.50)	1.50	ATH06	51	75	3	75	6	150	9	75	2	75	3		75	2	75	2	75	2	75	3		75	4	300	18	0.66	0.85	16.67	10	C																	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited	AEG Contract No :- 4322A
Date of Issue :- 26/08/2021	Page No. :- 7 of 19	Checked By :- [Redacted]	Certificate No. :- SPT/4322A/7





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. Cr	Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks		
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows
BH-SBC016	2.50 (155.63)	2.20 (2.50)	2.50	ATH06	51	75	3	75	3	150	6	75	4	75	4	75	4	75	4	300	16	1875	16	10	C	
BH-SBC016	3.50 (154.63)	2.70 (3.50)	3.50	ATH06	51	75	3	75	4	150	7	75	5	75	6	75	6	75	6	300	23	13.04	23	14	S	
BH-SBC016	4.50 (153.63)	2.70 (4.50)	4.50	ATH06	51	75	7	75	6	150	13	75	6	75	5	75	6	75	6	300	23	13.04	23	15	S	
BH-SBC017	1.50 (149.98)	Dry (1.50)	1.50	ATH06	51	75	2	75	3	150	5	75	2	75	3	75	3	75	5	300	12	25.00	12	7	S	
BH-SBC017	3.50 (147.98)	Dry (3.50)	3.50	ATH06	51	75	3	75	3	150	6	75	4	75	5	75	7	75	7	300	23	13.04	23	14	S	
BH-SBC017	5.50 (145.98)	Dry (5.50)	5.50	ATH06	51	75	4	75	4	150	8	75	4	75	6	75	7	75	9	300	26	11.54	26	18	S	
BH-SBC018	1.50 (152.14)	Dry (1.50)	1.50	ATH06	51	75	4	75	3	150	7	75	3	75	4	75	5	75	7	300	19	15.79	19	11	S	
BH-SBC018	2.50 (151.14)	Dry (2.50)	2.50	ATH06	51	75	3	75	3	150	6	75	4	75	4	75	5	75	7	300	20	15.00	20	12	C	
BH-SBC018	3.50 (150.14)	Dry (3.50)	3.50	ATH06	51	61	25	53	50	61	25	53	50							53	50	1.06	-	-	S	
BH-SBC019	1.20 (140.42)	0.57 (1.00)	1.20	ATH07	54	75	2	75	3	150	5	75	4	75	5	75	5	75	6	300	20	15.00	20	12	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Client :- AMEY OW Limited	AEG Contract No :- 4322A
	Date of Issue :- 26/08/2021		Approved By :- <span style="background-color: black; color: black;">[REDACTED]</span>	Certificate No. :- SPT/4322A/8
Page No. :- 8 of 19				



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)		Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E <sub>sp</sub>	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>ra</sub>	Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N <sub>60</sub>	Shoe or Cone		Remarks											
	Pen	Blows					Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows						Total Pen	Total Blows		S/C	S									
	mm	No.					mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.											mm	No.							
BH SBC019	2.50 (139.12)	25	75	3	150	28	54	75	4	75	5	75	5	75	5	75	5	300	19	19	12	S															
BH SBC019	3.50 (138.12)	27	75	3	150	30	54	75	3	75	3	75	6	75	7	300	19	15.79	13	13	13	S															
BH SBC019	5.00 (136.62)	8	75	5	150	13	54	75	4	75	3	75	5	75	8	300	20	15.00	20	20	14	S															
BH SBC019	6.00 (135.62)	5	75	5	150	10	54	75	6	75	4	75	5	75	6	300	21	14.29	21	16	16	S															
BH SBC020	1.20 (147.19)	2	75	3	150	5	54	75	3	75	6	75	7	75	8	300	24	12.50	24	14	14	S															
BH SBC020	2.50 (145.89)	21	75	8	150	29	54	75	8	75	4	75	8	75	4	300	24	12.50	24	15	15	S															
BH SBC020	4.00 (144.39)	5	75	4	150	9	54	75	15	75	5	75	6	75	7	300	33	9.09	33	23	23	S															
BH SBC020	6.00 (142.39)	15	75	12	150	27	54	75	5	75	4	75	9	75	8	300	26	11.54	26	20	20	S															
BH SBC020	7.00 (141.39)	3	75	5	150	8	54	75	9	75	7	75	8	75	8	300	32	9.38	32	25	25	S															
BH SBC020	8.00 (140.39)	10	75	9	150	19	54	75	7	75	8	75	7	75	8	300	30	10.00	30	25	25	S															

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>	AEG Contract No :- <b>4322A</b>
Date of Issue :- <b>26/08/2021</b>	Checked By :- [Redacted]	Approved By :- [Redacted]	Certificate No. :- <b>SPT/4322A/9</b>



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>h</sub> %	TEST DRIVE												Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) No	Shoe or Cone	Remarks
						SEATING DRIVE						TEST DRIVE											
						Pen	Blows	Pen	Blows	Total Pen	Total Blows	Pen	Blows	Pen	Blows	Total Pen	Total Blows						
BH SBC021	2.00 (146.44)	Dry (2.00)	2.00	T02	53	75	2	4	75	4	150	6	75	4	8	75	8	300	28	17	S		
BH SBC021	4.80 (143.64)	Dry (4.50)	4.80	T02	53	75	11	5	75	5	150	16	75	4	4	75	5	300	16	11	S		
BH SBC021	7.50 (140.94)	Dry (4.50)	7.50	T02	53	75	4	8	75	8	150	12	75	11	9	75	8	300	38	30	S		
BH SBC022	1.50 (144.53)	Dry (1.50)	1.50	ATH06	51	75	3	3	75	3	150	6	75	4	4	75	6	300	19	11	S		
BH SBC022	3.50 (142.53)	Dry (3.50)	3.50	ATH06	51	75	4	4	75	4	150	8	75	7	6	75	6	300	25	16	S		
BH SBC022	6.00 (140.03)	5.20 (6.00)	6.00	ATH06	51	75	3	7	75	7	150	10	75	14	36	75	5	96	50	-	S		
BH SBC023A	2.20 (143.16)	Dry (2.10)	2.20	T02	53	75	2	3	75	3	150	5	75	4	5	75	6	300	24	15	S		
BH SBC023A	3.70 (141.66)	Dry (3.10)	3.70	T02	53	75	3	14	75	14	150	17	75	20	10	75	8	300	48	32	S		
BH SBC023A	5.40 (139.96)	Dry (5.30)	5.40	T02	53	75	2	2	75	2	150	4	75	2	3	75	3	300	11	8	S		
BH SBC023A	8.00 (137.36)	6.50 (8.00)	8.00	T02	53	40	25		62	50	40	25	62	50				62	50	-	S		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title : A66 North Trans Pennine Scheme C Section 9	Client : AMEY OW Limited	AEG Contract No. : 4322A
Date of Issue : 26/08/2021	Page No. : 10 of 19	Checked By : [Redacted]	Certificate No. : SPT/4322A/10
			




# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RECORDS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>sp</sub> %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>r</sub>	Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks	
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen
BH SBC023A	9.30 (136.06)	7.20 (9.10)	9.30	T02	53	75	4	75	4	150	8	75	5	75	7	75	9	75	10	300	31	31	26	S	
BH SBC023A	10.70 (134.66)	9.10 (10.60)	10.70	T02	53	75	7	75	7	150	14	75	9	75	15	75	16	45	10	270	50	-	-	S	
BH SBC023A	14.00 (131.36)	4.20 (13.00)	14.00	T02	53	75	9	75	11	150	20	75	12	75	14	75	17	5	7	230	50	-	-	S	
BH SBC023A	15.70 (129.66)	6.10 (13.00)	15.70	T02	53	75	25	75	12	75	25	75	28	35	22					110	50	-	-	S	
BH SBC023A	16.20 (129.16)	6.50 (13.00)	16.20	T02	53	75	10	75	12	150	22	75	12	75	19	60	19			210	50	-	-	S	
BH SBC024	2.50 (143.40)	Dry (2.50)	2.50	ATH06	51	75	3	75	3	150	6	75	4	75	6	75	6	75	6	300	22	22	13	S	
BH SBC024	4.50 (141.40)	Dry (4.50)	4.50	ATH06	51	75	3	75	4	150	7	75	5	75	7	75	7	75	6	300	25	25	17	S	
BH SBC024	8.00 (137.90)	Dry (8.00)	8.00	ATH09	55	75	6	75	7	150	13	75	7	75	8	75	7	75	9	300	31	31	26	C	
BH SBC024	9.00 (136.90)	Damp (9.00)	9.00	ATH09	55	75	5	75	6	150	11	75	7	75	7	75	8	75	8	300	30	30	26	C	
BH SBC024	10.00 (135.90)	Damp (10.00)	10.00	ATH09	55	75	7	75	9	150	16	75	9	75	9	75	10	75	11	300	39	39	36	C	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	Client :-	AMEY OW Limited	AEG Contract No :-	4322A
	Date of Issue :-	26/08/2021	Checked By :-	[Redacted]	Certificate No. :-	SPT/4322A/11



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio %	SEATING DRIVE								TEST DRIVE								Rod Length Corr. $C_R$	Energy Ratio Corr. $C_E$	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) $N_{60}$	Shoe or Cone	Remarks					
						Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm								No.	Blows	Pen mm	No.	Total Pen mm
BH-SBC024	11.00 (134.90)	Damp (10.00)	11.00	ATH09	55	10	25	6	75	7	150	13	75	7	50	7	75	9	75	9	75	11	300	37	7	50	1.00	0.92	0.14	-	-	C	
BH-SBC024	12.00 (133.90)	Damp (10.00)	12.00	ATH09	55	75	6	7	75	7	150	13	75	8	8	75	9	75	9	75	11	300	37	7	50	1.00	0.92	8.11	34	34	C		
BH-SBC024	13.00 (132.90)	Damp (10.00)	13.00	ATH09	55	75	5	6	75	6	150	11	75	7	7	75	8	75	8	75	9	300	32	300	32	300	1.00	0.92	9.38	29	29	S	
BH-SBC024	14.00 (131.90)	Damp (10.00)	14.00	ATH09	55	75	7	10	75	10	150	17	75	9	9	75	10	75	12	75	12	300	43	300	43	300	1.00	0.92	6.98	40	40	C	
BH-SBC024	15.00 (130.90)	Damp (10.00)	15.00	ATH09	55	75	6	8	75	8	150	14	75	9	9	75	10	75	10	75	10	300	38	300	38	300	1.00	0.92	7.89	35	35	S	
BH-SBC024	16.00 (129.90)	Damp (10.00)	16.00	ATH09	55	75	5	7	75	7	150	12	75	8	8	75	8	75	9	75	9	300	35	300	35	300	1.00	0.92	8.57	32	32	C	
BH-SBC024	17.00 (128.90)	14.20 (10.00)	17.00	ATH09	55	15	25		75	25	15	25	75	38	38	75	12	12				87	50	87	50	87	1.00	0.92	1.74	-	-	C	
BH-SBC024	18.00 (127.90)	15.16 (10.00)	18.00	ATH09	55	75	12	13	75	13	94	25	75	21	21	75	11	29				86	50	86	50	86	1.00	0.92	1.72	-	-	S	
BH-SBC024	19.00 (126.90)	16.03 (10.00)	19.00	ATH09	55	75	7	8	75	8	150	15	75	8	8	75	9	9	75	9	75	8	34	34	300	34	1.00	0.92	8.82	31	31	C	
BH-SBC024	20.00 (125.90)	16.10 (10.00)	20.00	ATH09	55	75	5	6	75	6	150	11	75	7	7	75	7	7	75	8	75	8	300	30	300	30	1.00	0.92	10.00	28	28	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited	AEG Contract No :- 4322A
Date of Issue :- 26/08/2021	Page No. :- 12 of 19	Checked :-	Certificate No. :- SPT/4322A/12
			



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)		Water Depth (Casing)	Rod Length		SPT Hammer Ref.	Energy Ratio E <sub>a</sub>	SEATING DRIVE												TEST DRIVE												Rod Length Corr. C <sub>r</sub>	Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone		Remarks
	m	(m)		m	m			Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		No.	mm	No.	mm	No.	mm	No.	mm						S/C		
								Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Total Pen	Total Blows																
BH SBC024	21.00 (124.90)	19.43 (10.00)	21.00	ATH09	55	6	75	7	150	13	75	7	75	8	75	8	75	8	75	7	75	8	75	8	75	9	300	32	29	S									
BH SBC024	22.00 (123.90)	20.60 (10.00)	22.00	ATH09	55	5	75	6	150	11	75	7	75	7	75	8	75	7	75	7	75	7	75	9	300	31	29	C											
BH SBC024	23.00 (122.90)	19.10 (10.00)	23.00	ATH09	55	6	75	7	150	13	75	9	75	10	75	9	75	11	300	39	39	7.69	36	33	S														
BH SBC024	24.00 (121.90)	18.46 (10.00)	24.00	ATH09	55	5	75	7	150	12	75	8	75	9	75	9	75	10	300	36	36	8.33	33	33	S														
BH SBC025	2.30 (140.87)	DRY (2.20)	2.30	TQ2	53	2	75	2	150	4	75	3	75	4	75	4	75	4	300	17	17	17.65	10	14	S														
BH SBC025	4.20 (138.77)	DRY (4.10)	4.20	TQ2	53	2	75	6	150	8	75	5	75	5	75	5	75	6	300	21	21	14.29	14	14	S														
BH SBC025	6.70 (136.27)	6.50 (6.70)	6.70	TQ2	53	6	75	7	150	13	75	7	75	9	75	9	75	14	300	39	39	7.69	30	30	S														
BH SBC025	9.00 (133.97)	Damp (8.40)	9.00	ATH09	55	5	75	6	150	11	75	6	75	7	75	7	75	8	300	28	28	10.71	25	25	C														
BH SBC025	10.00 (132.97)	Damp (8.40)	10.00	ATH09	55	10	75	15	150	25	75	28	11	22	86	50	1.72	-	-	-	-	-	-	-	-	-	-	-	S										
BH SBC025	11.00 (131.97)	Damp (8.40)	11.00	ATH09	55	6	75	7	150	13	75	7	75	9	75	9	75	9	300	33	33	9.09	30	30	C														

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>		Client :- <b>AMEY OW Limited</b>		AEG Contract No :- <b>4322A</b>	
	Date of Issue :- <b>26/08/2021</b>		Checked By :- <span style="background-color: black; color: black;">[REDACTED]</span>		Approved By :- <span style="background-color: black; color: black;">[REDACTED]</span>	
Page No. :- <b>13 of 19</b>		Certificate No. :- <b>SPT/4322A/13</b>				

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST REPORT (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>s</sub> %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>R</sub>	Energy Ratio Corr. C <sub>E</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone S/C	Remarks										
						Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows	Pen mm	Blows								Pen mm	Blows	Total Pen mm	Total Blows						
BH-SBC025	12.00 (130.97)	Damp (8.40)	12.00	ATH09	55	75	5	75	6	75	7	75	7	75	7	75	7	75	7	75	8	300	28	26	28	10.71	0.92	1.00	0.92	10.71	28	26	S	
BH-SBC025	13.00 (129.97)	Damp (8.40)	13.00	ATH09	55	75	6	75	7	75	8	75	8	75	8	75	9	75	9	75	10	300	34	31	34	8.82	0.92	1.00	0.92	8.82	34	31	C	
BH-SBC025	14.00 (128.97)	Damp (8.40)	14.00	ATH09	55	75	5	75	6	75	7	75	7	75	7	75	8	75	8	75	8	300	30	28	30	10.00	0.92	1.00	0.92	10.00	30	28	S	
BH-SBC025	15.00 (127.97)	Damp (8.40)	15.00	ATH09	55	75	7	75	8	75	10	75	10	75	10	75	10	75	10	75	11	300	40	37	40	7.50	0.92	1.00	0.92	7.50	40	37	C	
BH-SBC025	16.00 (126.97)	14.10 (8.40)	16.00	ATH09	55	10	25	6	10	25	6	50	6	50	6	50	6	50	6	50	6	6	50	-	0.12	0.92	1.00	0.92	0.12	-	-	S		
BH-SBC025	17.00 (125.97)	16.10 (8.40)	17.00	ATH09	55	75	7	75	9	75	10	75	10	75	10	75	10	75	10	75	11	300	41	38	41	7.32	0.92	1.00	0.92	7.32	41	38	S	
BH-SBC025	18.00 (124.97)	17.40 (8.40)	18.00	ATH09	55	75	6	75	9	75	10	75	10	75	10	75	10	75	10	75	10	300	39	36	36	7.69	0.92	1.00	0.92	7.69	39	36	C	
BH-SBC025	19.00 (123.97)	Damp (8.40)	19.00	ATH09	55	75	8	75	9	75	10	75	10	75	10	75	11	75	11	75	14	300	45	41	45	6.67	0.92	1.00	0.92	6.67	45	41	C	
BH-SBC025	20.00 (122.97)	Damp (8.40)	20.00	ATH09	55	75	5	75	6	75	7	75	7	75	8	75	8	75	8	75	9	300	32	29	29	9.38	0.92	1.00	0.92	9.38	32	29	S	
BH-SBC025	21.00 (121.97)	13.12 (8.40)	21.00	ATH09	55	75	4	75	5	75	6	75	6	75	7	75	8	75	8	75	9	300	30	28	30	10.00	0.92	1.00	0.92	10.00	30	28	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No. :-

4322A

Date of Issue :-

26/08/2021

Checked by

Approved by

Certificate No. :-

SPT/4322A/14





# ALLIED EXPLORATION & GEOTECHNICS LIMITED


Head Office: [REDACTED]  
 Regional Office: [REDACTED]  
 Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E <sub>s</sub>	SEATING DRIVE						TEST DRIVE						Energy Ratio C <sub>r</sub>	Rod Length Corr. C <sub>r</sub>	C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								
BH SBC025	22.00 (120.97)	17.45 (8.40)	22.00	ATH09	55	75	7	75	8	150	15	75	9	75	10	75	10	75	10	300	38	38	35	C	
BH SBC025	23.00 (119.97)	16.19 (8.40)	23.00	ATH09	55	75	5	75	8	150	13	75	8	75	10	75	11	300	38	38	35	C			
BH SBC025	24.00 (118.97)	18.15 (8.40)	24.00	ATH09	55	75	6	75	7	150	13	75	9	75	10	75	10	300	39	39	36	C			
BH SBC026	2.30 (141.34)	Dry (2.20)	2.30	TO2	53	75	2	75	4	150	6	75	5	75	6	75	7	300	24	24	15	S			
BH SBC026	3.40 (140.24)	Dry (3.10)	3.40	TO2	53	75	4	75	6	150	10	75	3	75	6	75	6	300	18	18	12	S			
BH SBC026	5.30 (138.34)	Dry (4.60)	5.30	TO2	53	75	4	75	4	150	8	75	5	75	7	75	9	300	30	-	-	S			
BH SBC026	6.10 (137.54)	Dry (4.60)	6.10	TO2	53	75	4	75	17	150	21	75	28	35	22	75	22	110	50	30	22	S			
BH SBC026	7.50 (136.14)	Dry (6.10)	7.50	TO2	53	75	3	75	6	150	9	75	3	75	4	75	8	300	23	23	18	S			
BH SBC027	3.20 (138.76)	Dry (3.10)	3.20	TO2	53	75	3	75	3	150	6	75	5	75	6	75	12	300	26	26	17	S			
BH SBC027	4.20 (137.76)	Dry (3.10)	4.20	TO2	53	75	8	75	4	150	12	75	3	75	5	75	5	300	19	19	13	S			

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title : A66 North Trans Pennine Scheme C Section 9	Client : AMEY OW Limited	AEG Contract No. :- 4322A
Date of Issue : 26/08/2021	Page No. :- 15 of 19	Checked By : [REDACTED]	Certificate No. :- SPT/4322A/15
			





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E <sub>sp</sub> %	SEATING DRIVE										TEST DRIVE										Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N <sub>60</sub>	Shoe or Cone		Remarks				
						Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen						No.	mm		No.	mm	No.	mm
						Pen	No.	Pen	No.	Blows	No.	Pen	No.	Blows	No.	Pen	No.	Blows	No.	Pen	No.	Blows	No.	Pen	No.											
BH SBC029	5.50 (144.67)	3.98 (5.50)	5.50	ATH07	54	7	75	8	150	15	4	75	5	75	8	75	6	300	23	17	S	S														
BH SBC029	7.50 (142.67)	4.46 (7.30)	7.50	ATH07	54	6	75	8	150	14	9	75	7	75	9	75	8	300	33	27	S	S														
BH SBC029	9.00 (141.17)	4.78 (8.80)	9.00	ATH07	54	4	75	5	150	9	5	75	17	75	12	75	9	300	43	37	S	S														
BH SBC029	10.00 (140.17)	5.04 (9.80)	10.00	ATH07	54	6	75	7	150	13	7	75	15	75	14	75	12	300	48	43	S	S														
BH SBC030	1.20 (149.06)	Dry (1.00)	1.20	ATH07	54	3	75	4	150	7	5	75	7	75	8	75	9	300	29	17	S	S														
BH SBC030	2.50 (147.76)	Dry (2.30)	2.50	ATH07	54	2	75	3	150	5	3	75	4	75	4	75	5	300	16	10	S	S														
BH SBC030	4.00 (146.26)	Dry (3.80)	4.00	ATH07	54	3	75	3	150	6	3	75	4	75	5	75	7	300	19	13	S	S														
BH SBC030	5.50 (144.76)	3.64 (4.69)	5.50	ATH07	54	3	75	4	150	7	5	75	7	75	8	75	8	300	28	21	S	S														
BH SBC030	7.50 (142.76)	3.96 (7.30)	7.50	ATH07	54	5	75	6	150	11	8	75	10	75	8	75	6	300	32	26	S	S														
BH SBC030	9.00 (141.26)	4.04 (8.80)	9.00	ATH07	54	7	75	9	150	16	11	75	12	75	13	75	11	300	47	41	S	S														

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited	AEG Contract No :- 4322A
Date of Issue :- 26/08/2021	Checked By :- [Redacted]	Approved By :- [Redacted]	Certificate No. :- SPT/4322A/17
			



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. $C_{Rd}$	Energy Ratio Corr. $C_E$	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) $N_{60}$	Shoe or Cone	Remarks	
						Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows								Pen mm
BH SBC030	10.00 (140.26)	4.13 (9.80)	10.00	ATH07	54	75	6	75	7	13	75	11	75	11	75	11	75	13	300	44	6.82	44	40	S	
BH SBC031	1.20 (154.43)	Dry (1.00)	1.20	ATH07	54	75	2	75	3	5	75	6	75	6	75	4	75	14	300	14	21.43	18	11	S	
BH SBC031	3.00 (152.63)	Dry (2.80)	3.00	ATH07	54	75	2	75	3	5	75	5	75	5	75	7	75	16	300	16	18.75	24	16	S	
BH SBC031	5.00 (150.63)	Dry (4.80)	5.00	ATH07	54	75	3	75	5	8	75	7	75	7	75	7	75	20	300	20	15.00	28	20	S	
BH SBC031	8.00 (147.63)	Dry (7.80)	8.00	ATH07	54	75	4	75	3	7	75	4	75	4	75	6	75	17	300	17	17.65	23	19	S	
BH SBC031	11.00 (144.63)	Dry (10.80)	11.00	ATH07	54	75	5	75	4	9	75	7	75	6	75	7	75	20	300	20	15.00	25	23	S	
BH SBC031	14.00 (141.63)	Dry (13.80)	14.00	ATH07	54	75	3	75	4	7	75	4	75	5	75	5	75	14	300	14	21.43	20	18	S	
BH SBC031	16.00 (139.63)	Dry (15.80)	16.00	ATH07	54	75	6	75	5	11	75	8	75	8	75	6	75	19	300	19	15.79	46	41	S	
BH SBC032	1.20 (146.35)	Damp (1.00)	1.20	ATH07	54	75	3	75	4	7	75	3	75	4	75	4	75	16	300	16	18.75	16	9	S	
BH SBC032	3.00 (144.55)	Dry (2.80)	3.00	ATH07	54	75	4	75	5	9	75	5	75	5	75	6	75	22	300	22	13.64	22	14	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No. :-

4322A



Date of Issue :-

26/08/2021

Checked

18 of 19

Approved By

Certificate No. :-

SPT/4322A/18



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Felton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS

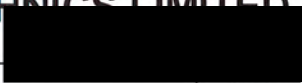
(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E <sub>sp</sub>	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C <sub>r</sub>	Energy Ratio Corr. C <sub>e</sub>	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N <sub>60</sub>	Shoe or Cone	Remarks
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows							
BH SBC032	4.00 (143.55)	Dry (3.80)	4.00	ATH07	54	10	25	75	3	4	75	4	150	7	25	100	25	100	0.25	-	-	S		
BH SBC032A	4.00 (143.47)	Dry (3.80)	4.00	ATH07	54	75	3	75	4	75	4	150	7	150	7	210	21	14.29	14	14	S			
BH SBC032A	6.50 (140.97)	Dry (6.30)	6.50	ATH07	54	75	3	75	4	75	4	150	7	150	7	210	21	12.00	19	19	S			
BH SBC032A	9.50 (137.97)	Dry (9.30)	9.50	ATH07	54	75	4	75	5	75	5	150	9	150	7	260	26	11.54	23	23	S			

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited	AEG Contract No :- 4322A
Date of Issue :- 26/08/2021	Page No. :- 19 of 19	Checked By :- [Redacted]	Certificate No. :- SPT/4322A/19
Approved By :- [Redacted]			

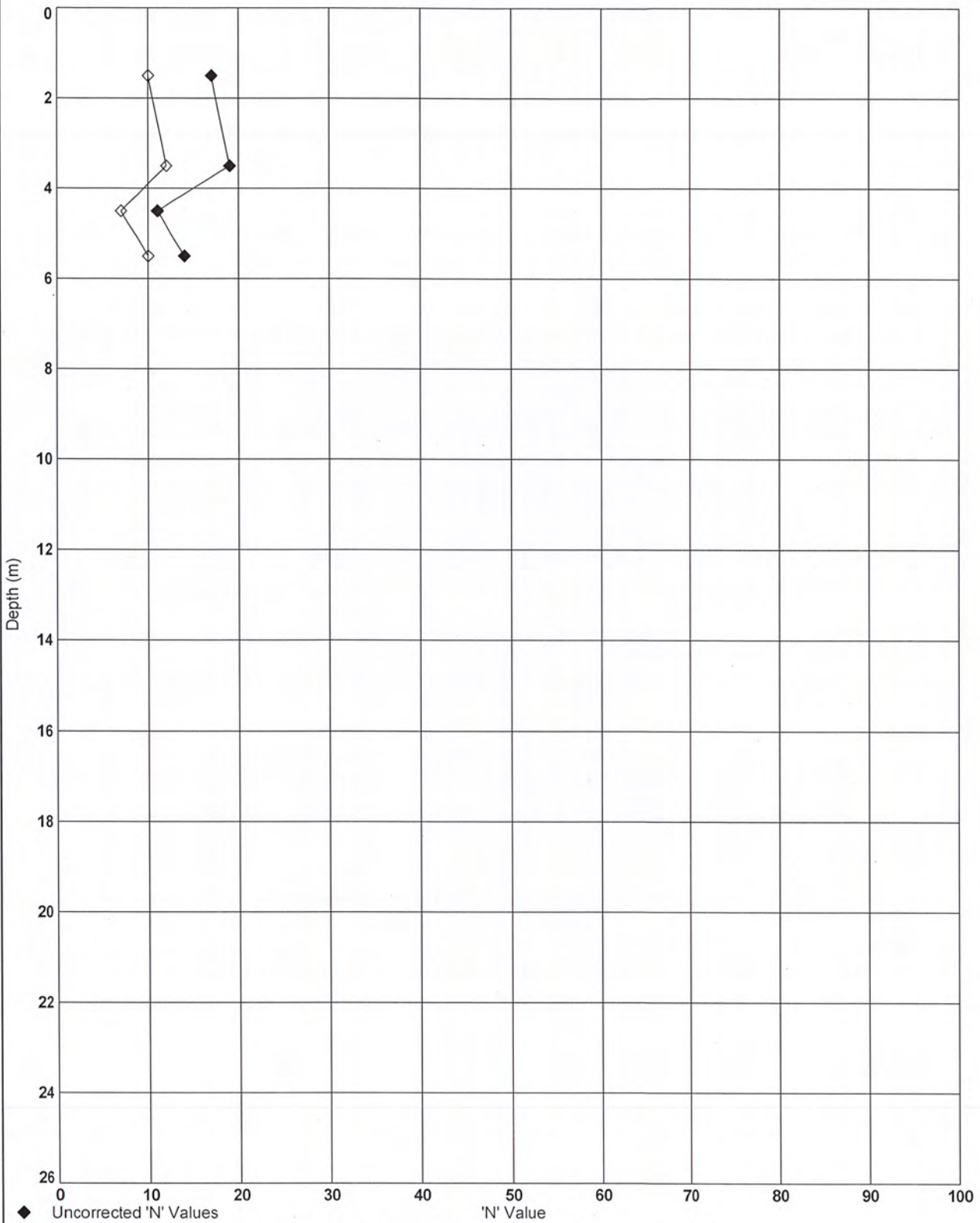




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

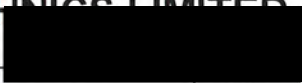
BH SBC002



Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Date of issue :- 26/08/2021	Certificate No :- SPT/4322A/Graph/BH SBC002	Operator :- K. Roderson	
	Checked:	Approved:	AEG Contract No. :- 4322A	

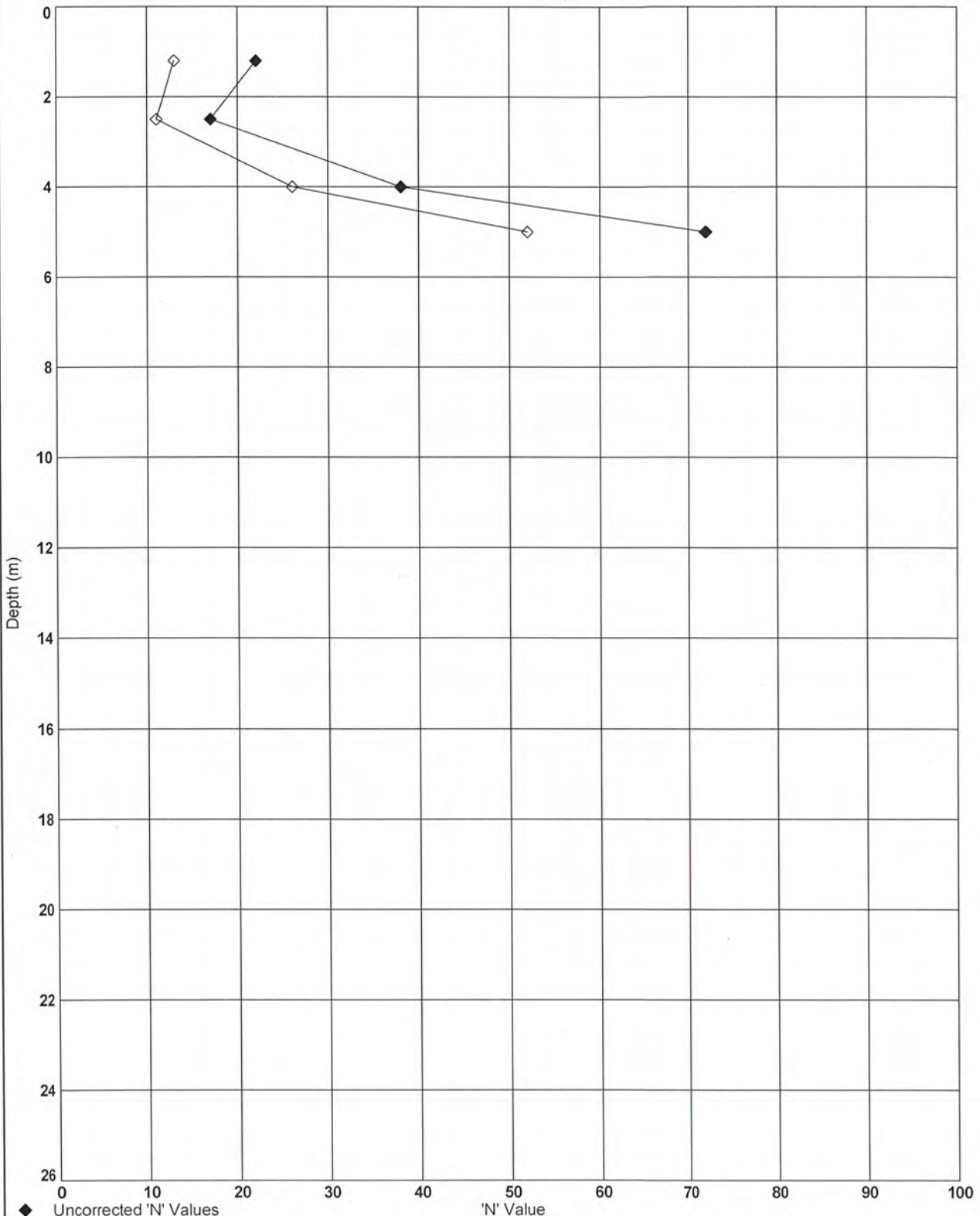




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC005



- ◆ Uncorrected 'N' Values
- ◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC005  
 Approved: [Redacted]

Operator :- L.S./E.B.  
 AEG Contract No. :- 4322A

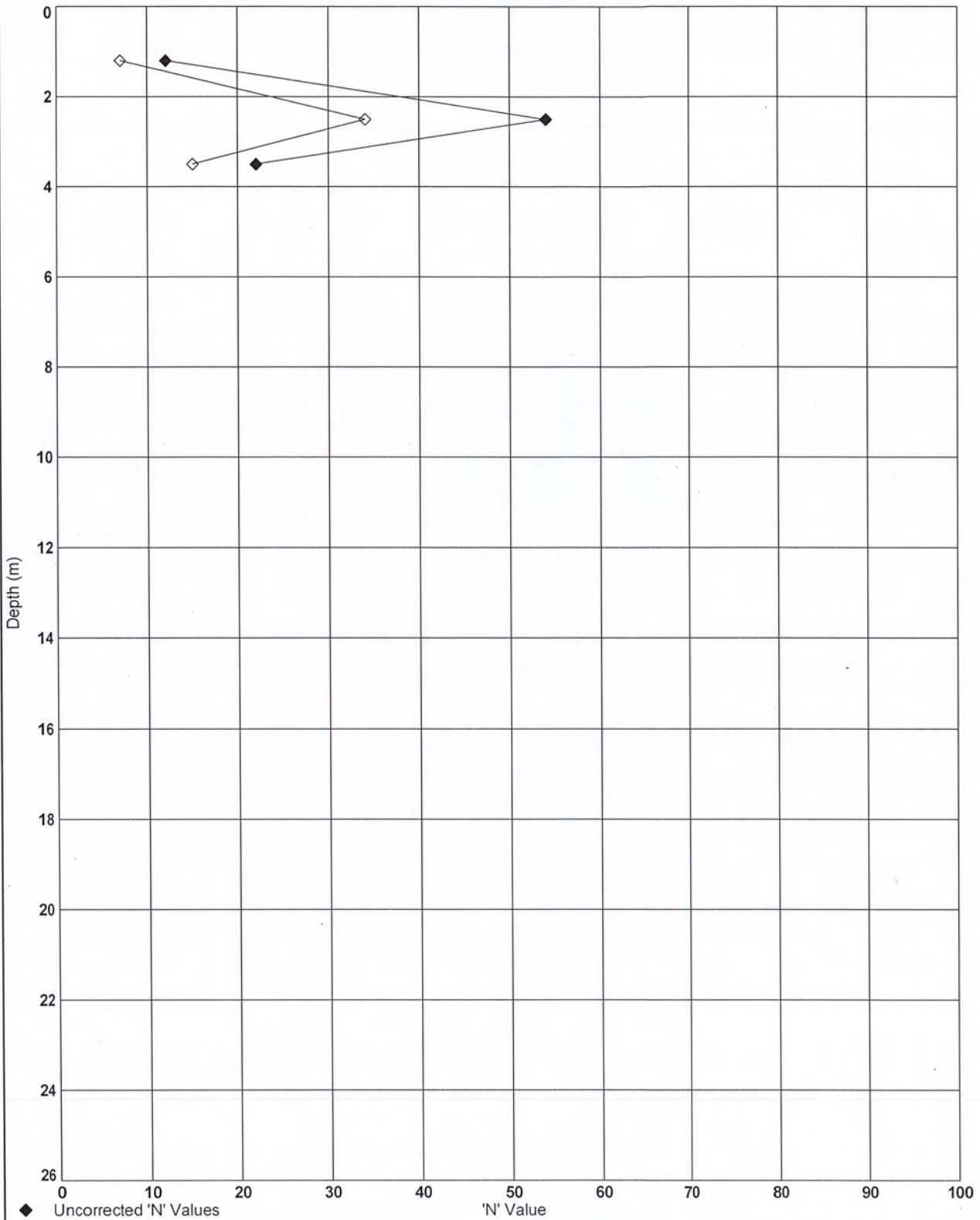




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC006



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC006  
 Approved by: [Redacted]

Operator :- L.S./E.B.  
 AEG Contract No. :- 4322A



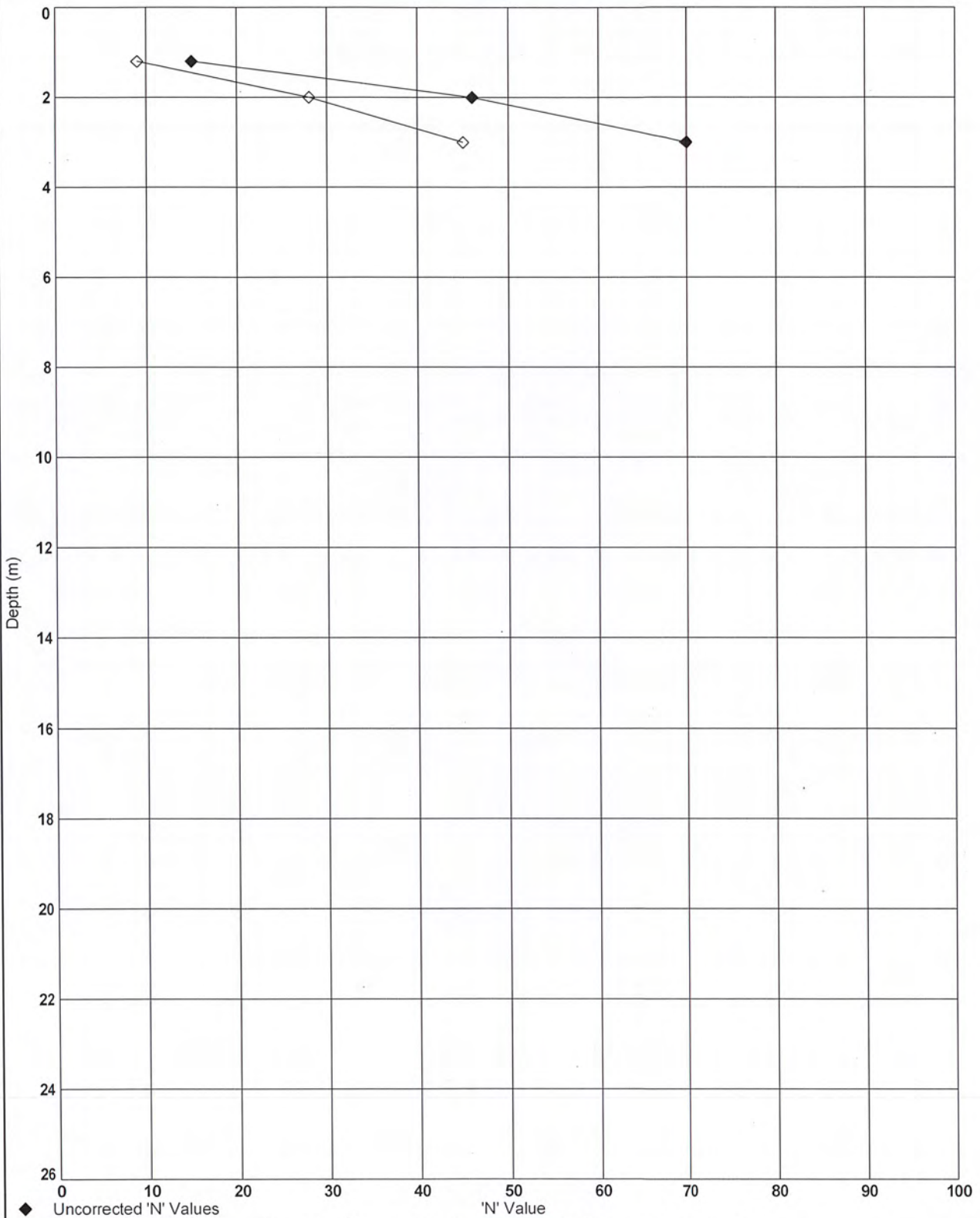




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC007



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC007  
 Approved by: [Redacted]

Operator :- L.S./E.B.  
 AEG Contract No. :- 4322A



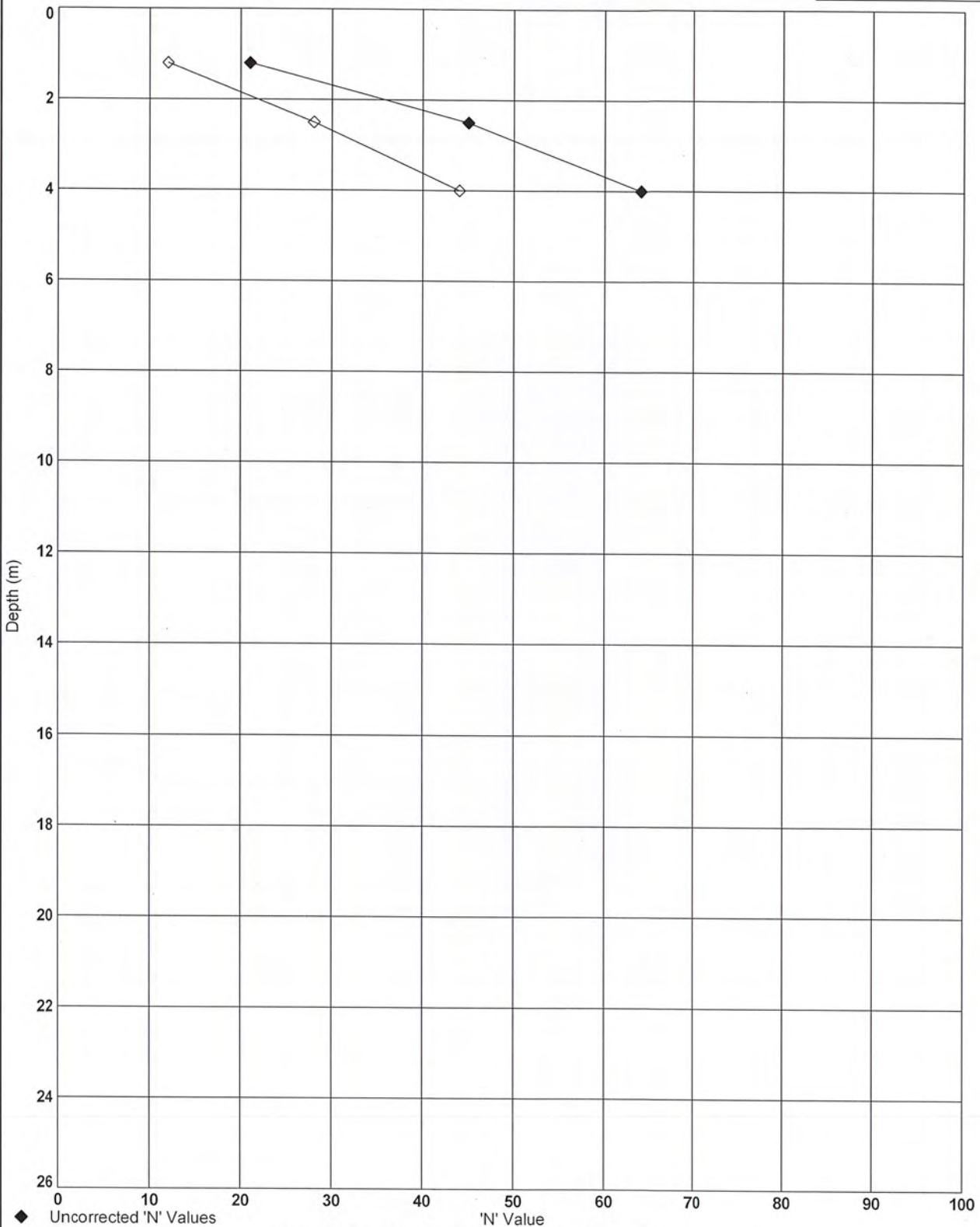
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC008



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



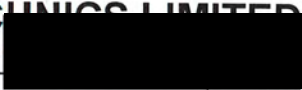
Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC008  
 Approved: [Redacted]

Operator :- L. Selkirk  
 AEG Contract No. :- 4322A



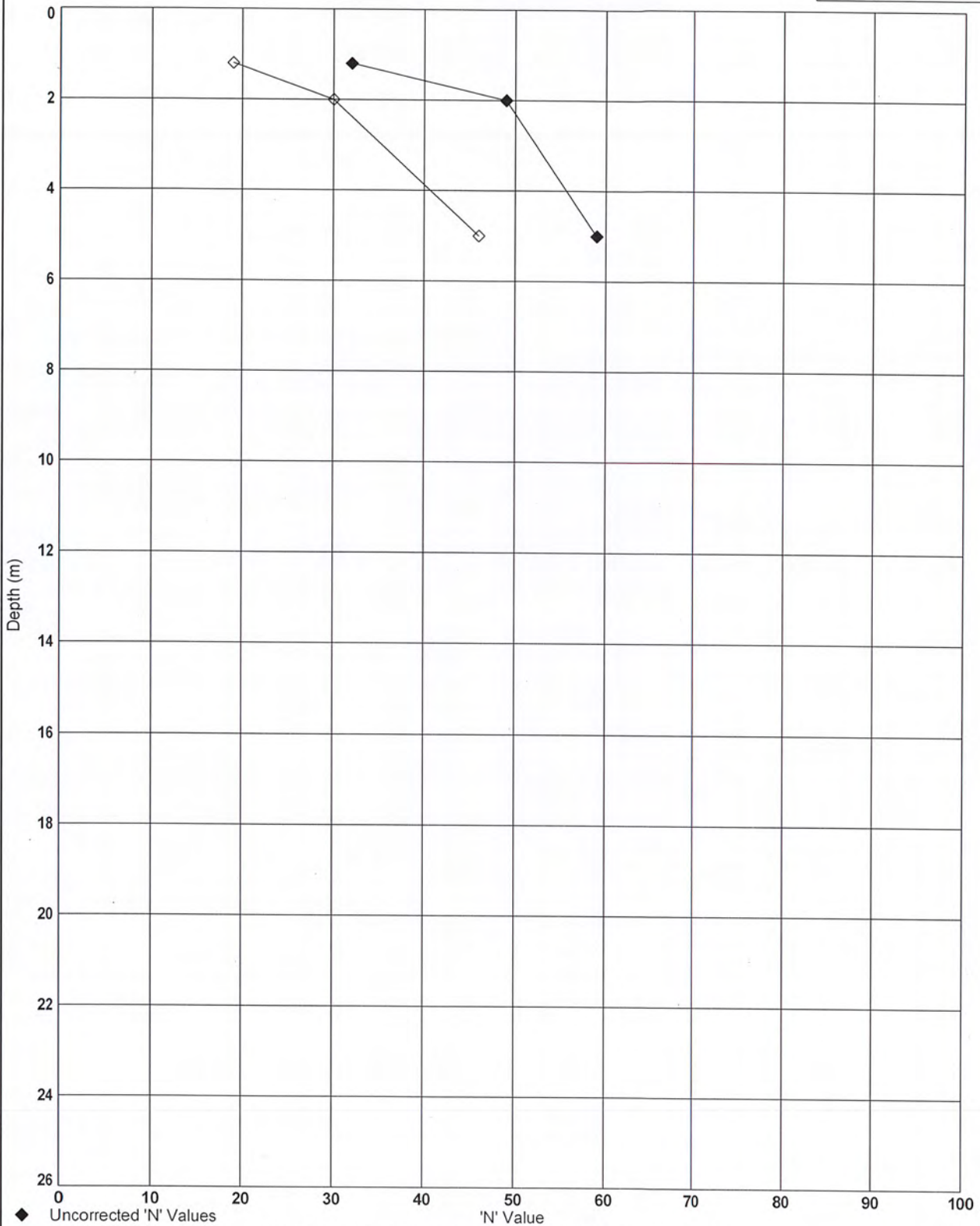




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC009



Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Date of issue :- 26/08/2021	Certificate No :- SPT/4322A/Graph/BH SBC009	Operator :- L.S./E.B.	
	Checked:	Approved:	AEG Contract No. :- 4322A	

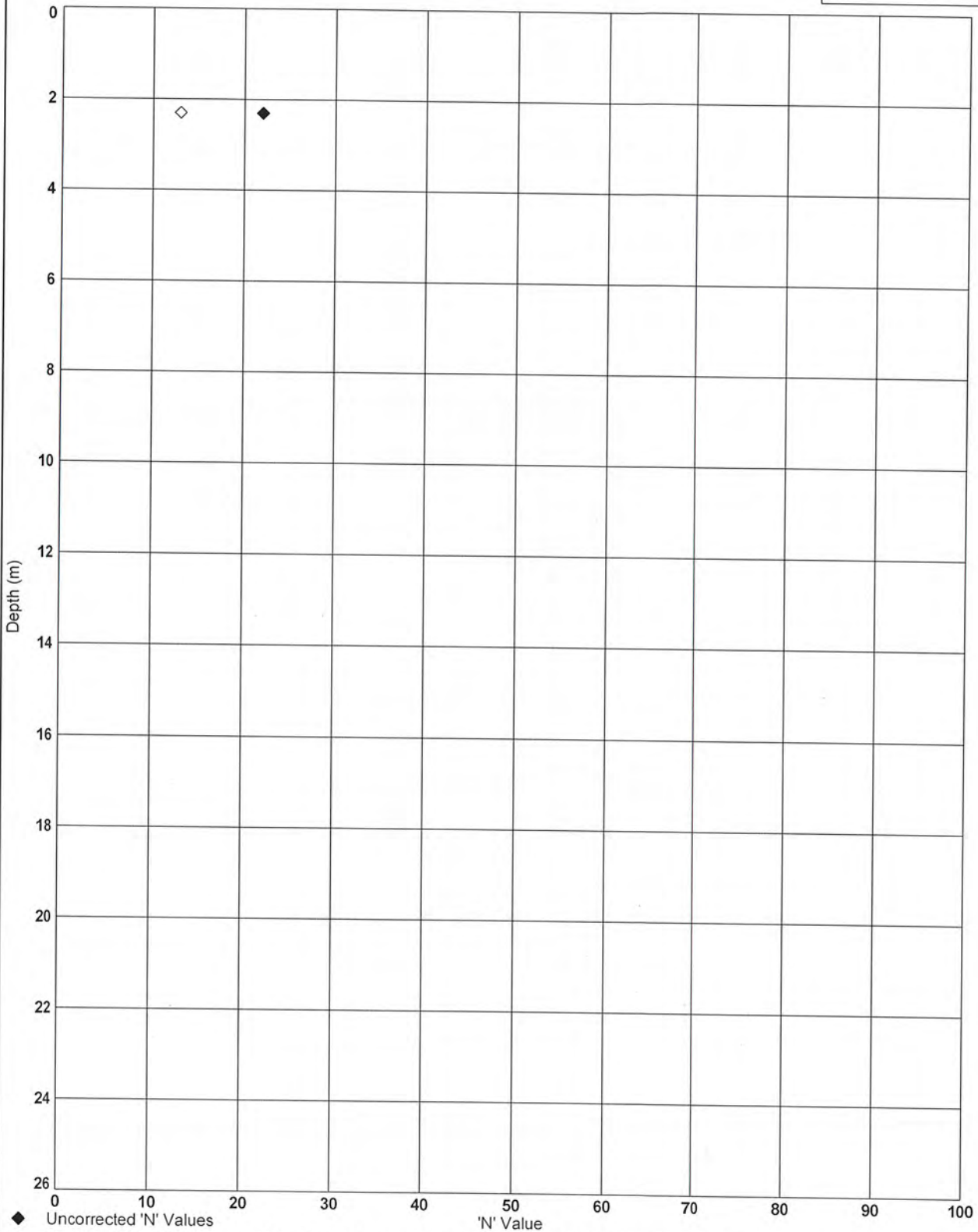
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC010



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Date of issue :-

26/08/2021

Certificate No :-

SPT/4322A/Graph/BH SBC010

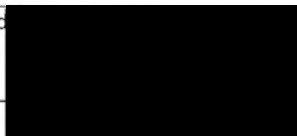
Operator :-

T. Quinn

Checked



Approved



AEG Contract No. :-

4322A



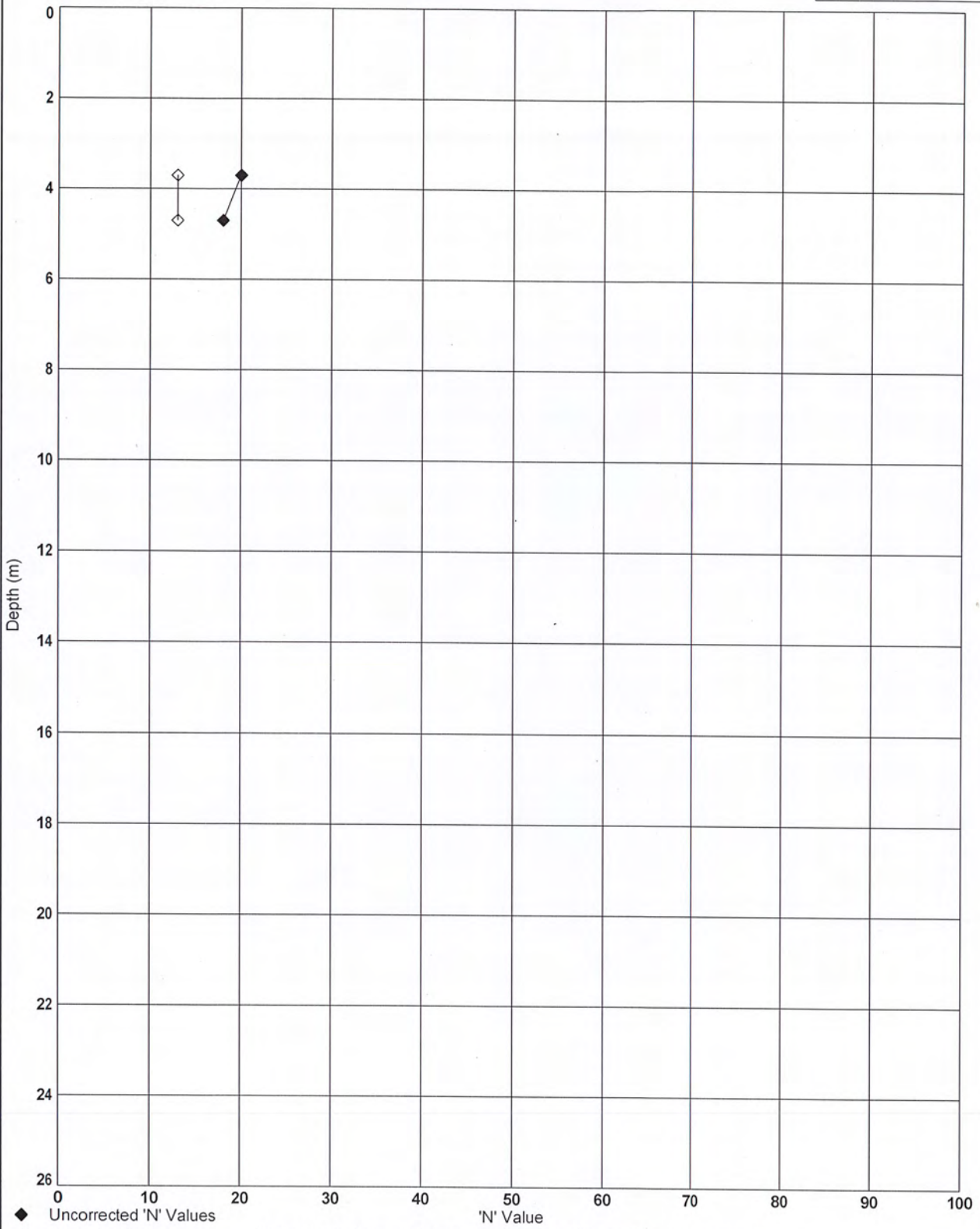




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC010A



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-  
A66 North Trans Pennine Scheme C Section 9

Client :-  
AMEY OW Limited



Date of issue :-  
26/08/2021

Certificate No :-  
SPT/4322A/Graph/BH SBC010A

Operator :-  
T. Quinn

Checked [Redacted]

Approved [Redacted]

AEG Contract No. :-  
4322A

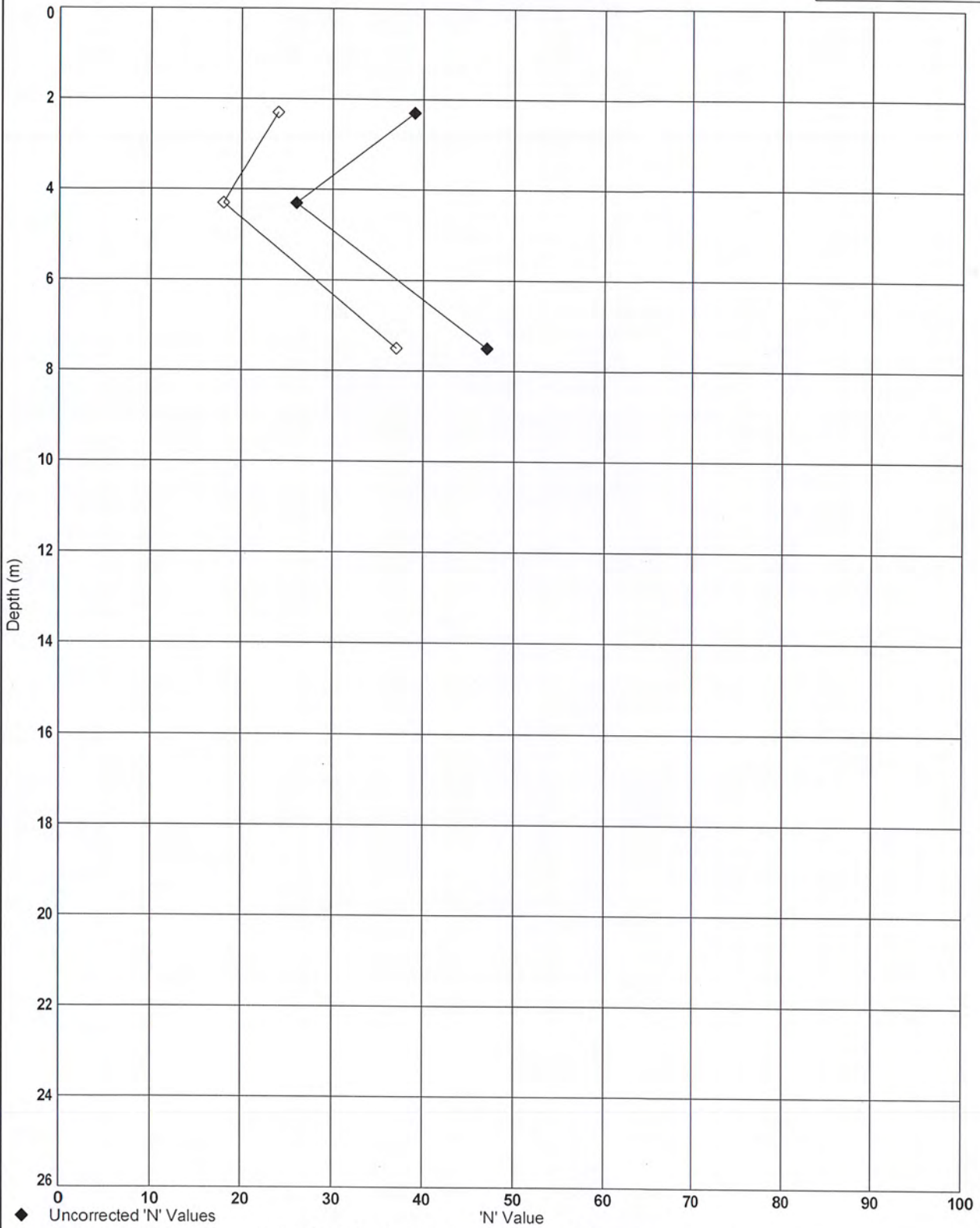




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC011



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC011  
 Approved: [Redacted]

Operator :- T. Quinn  
 AEG Contract No. :- 4322A





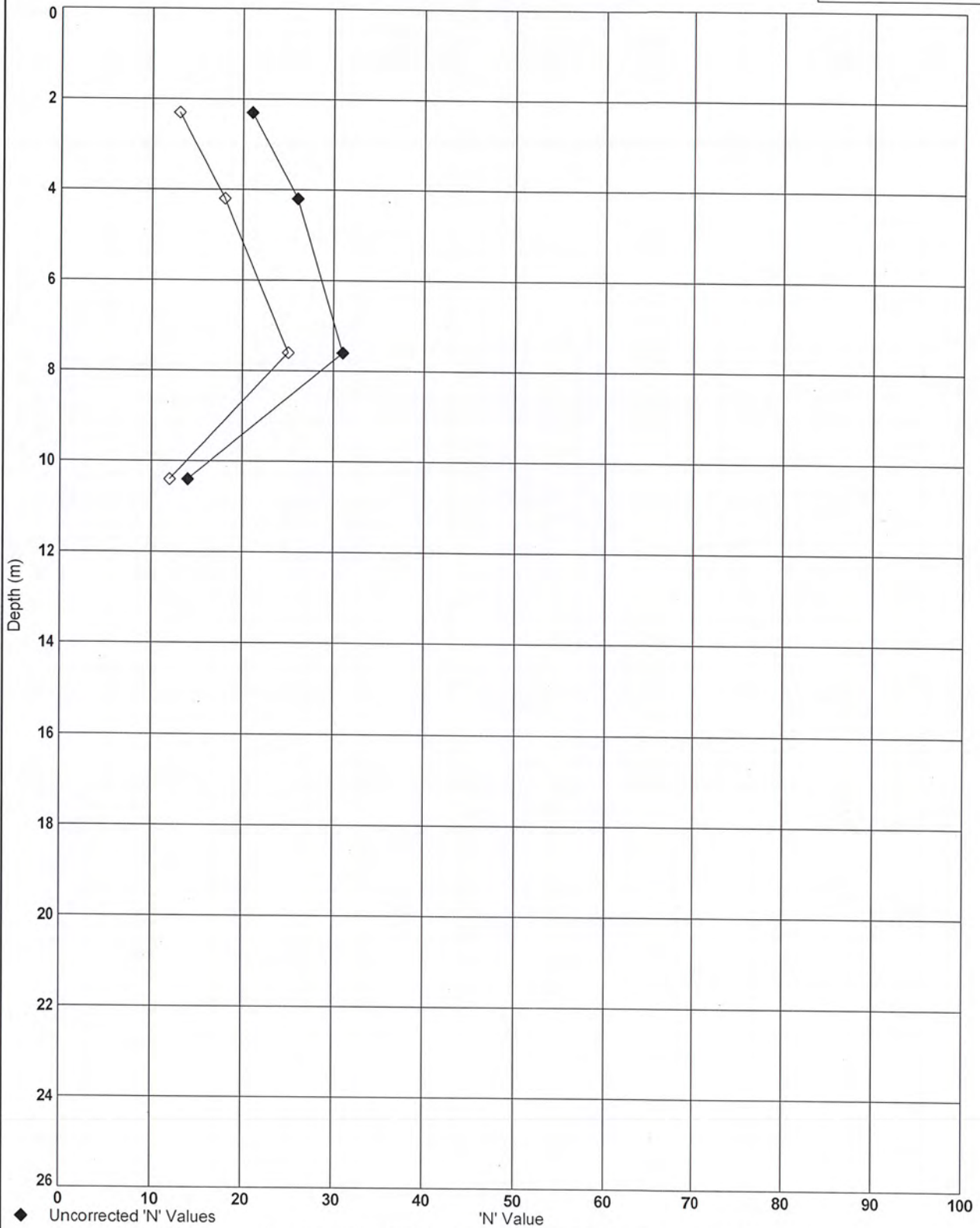
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC012



Contract Title :-  
 A66 North Trans Pennine Scheme C Section 9

Client :-  
 AMEY OW Limited



Date of issue :-  
 26/08/2021

Checked [Redacted]

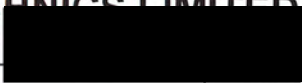
Certificate No :-  
 SPT/4322A/Graph/BH SBC012

Approved [Redacted]

Operator :-  
 T. Quinn

AEG Contract No. :-  
 4322A

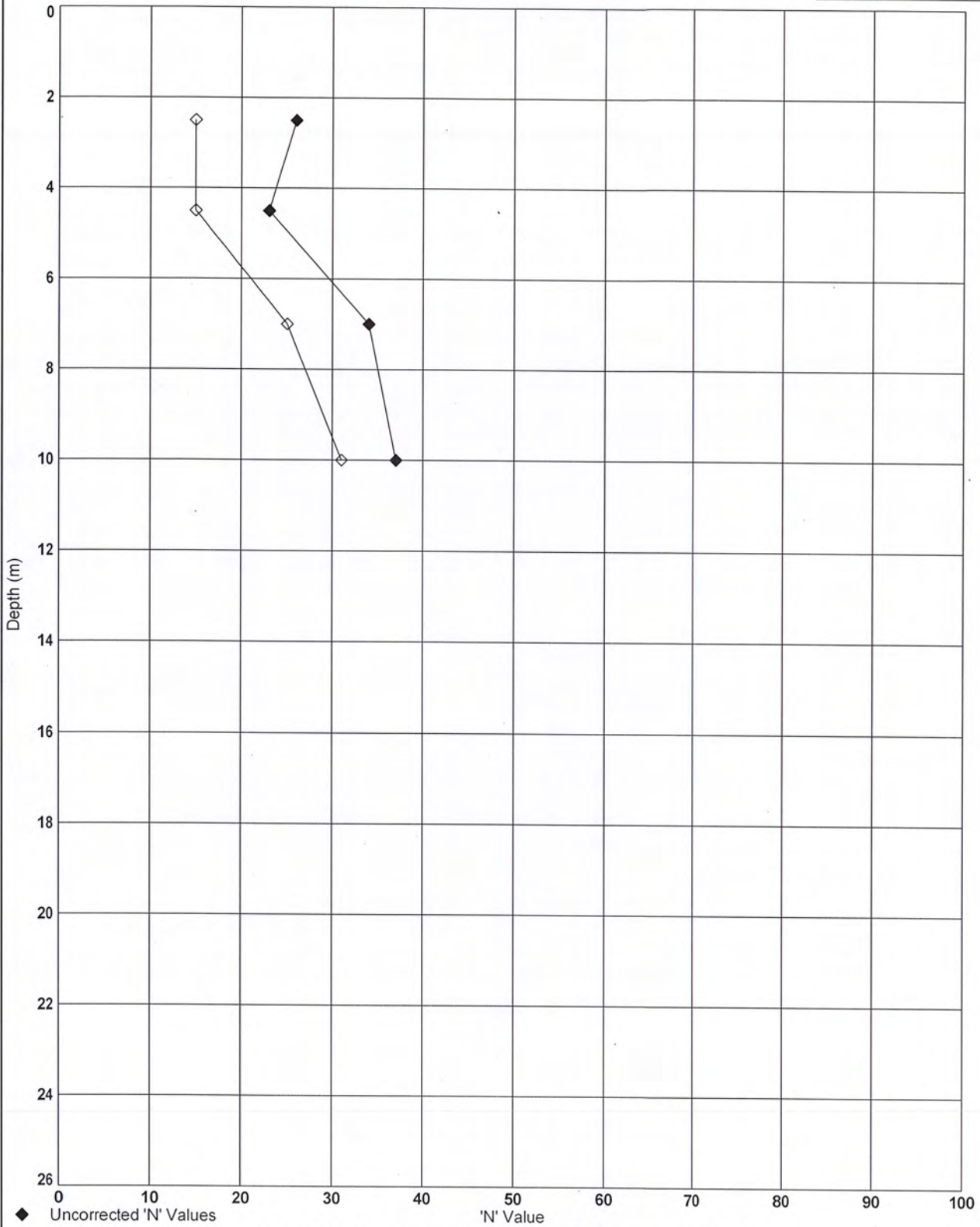




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC013



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC013  
 Approved: [Redacted]

Operator :- K. Roderson  
 AEG Contract No. :- 4322A





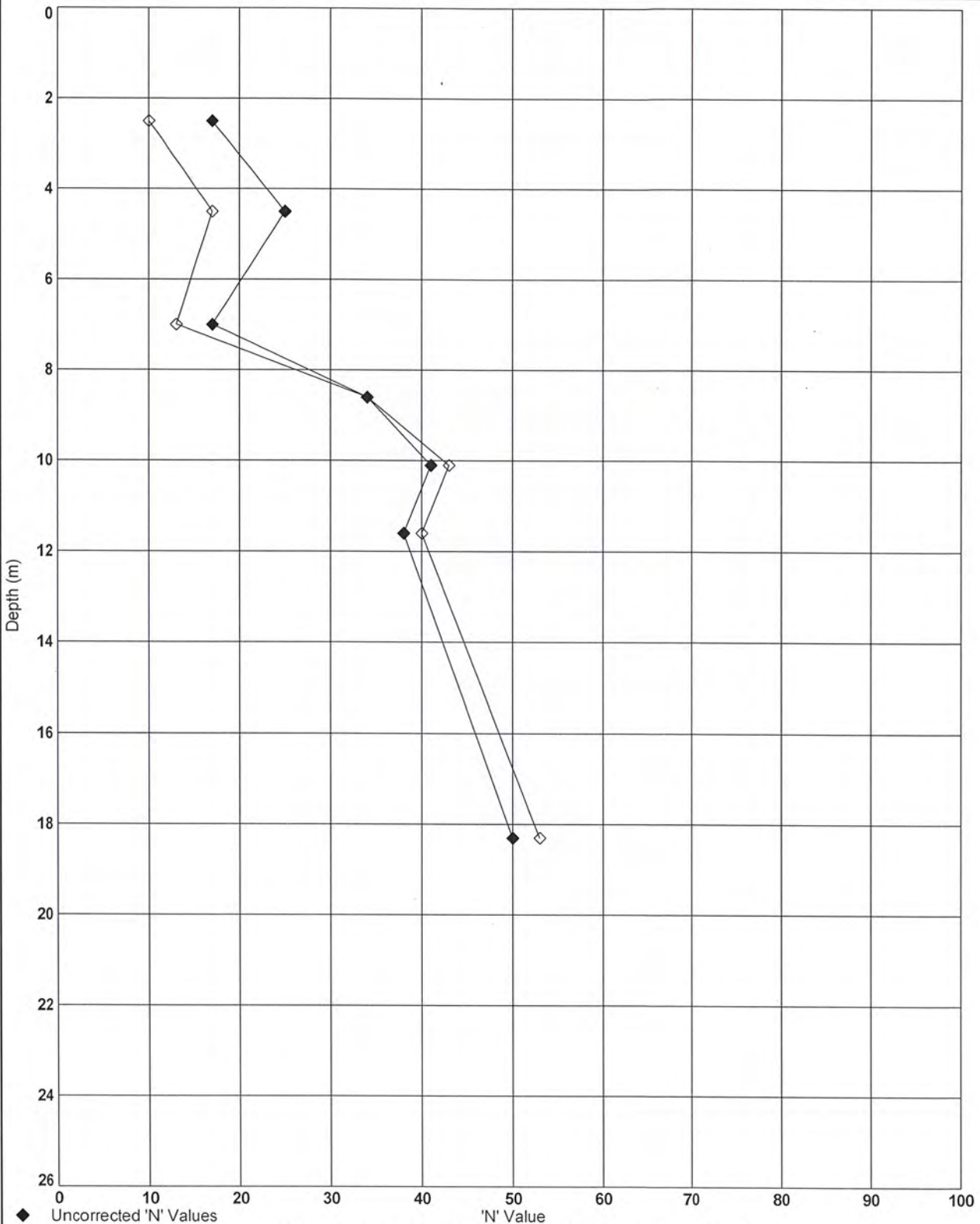
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC014A



Contract Title :-  
 A66 North Trans Pennine Scheme C Section 9

Client :-  
 AMEY OW Limited



Date of issue :-  
 26/08/2021  
 Checked: [Redacted]

Certificate No :-  
 SPT/4322A/Graph/BH SBC014A  
 Approved: [Redacted]

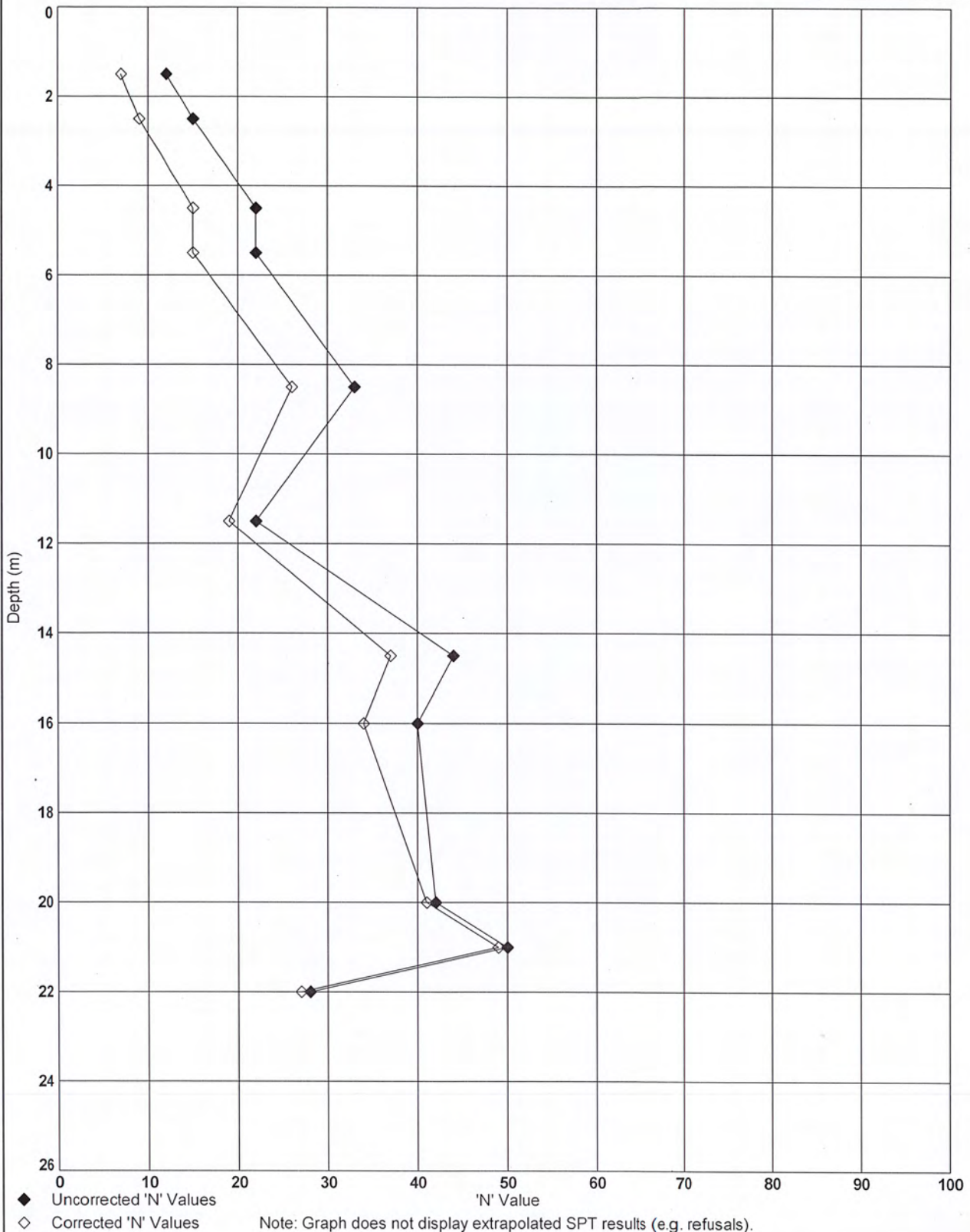
Operator :-  
 K.R./P.D.  
 AEG Contract No. :-  
 4322A




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

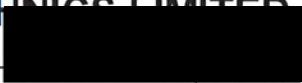
BH SBC015



Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Date of issue :- 26/08/2021	Certificate No :- SPT/4322A/Graph/BH SBC015	Operator :- K.R./E.B.
	Checked [Redacted]	Approved [Redacted]	AEG Contract No. :- 4322A

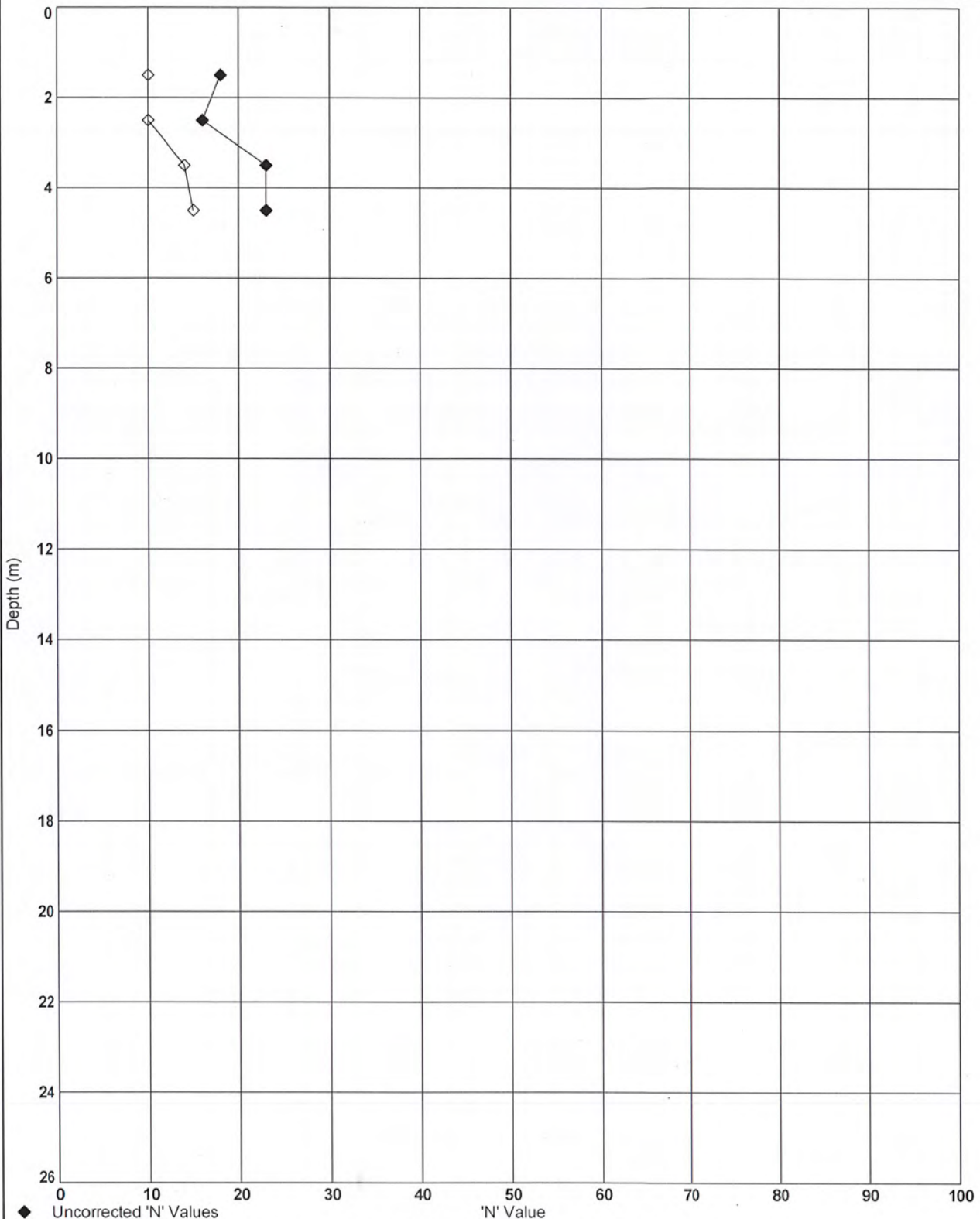




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC016



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :-  
26/08/2021

Certificate No :-  
SPT/4322A/Graph/BH SBC016

Operator :-  
K. Roderson

Checked: [Redacted]

Approved: [Redacted]

AEG Contract No. :-  
4322A



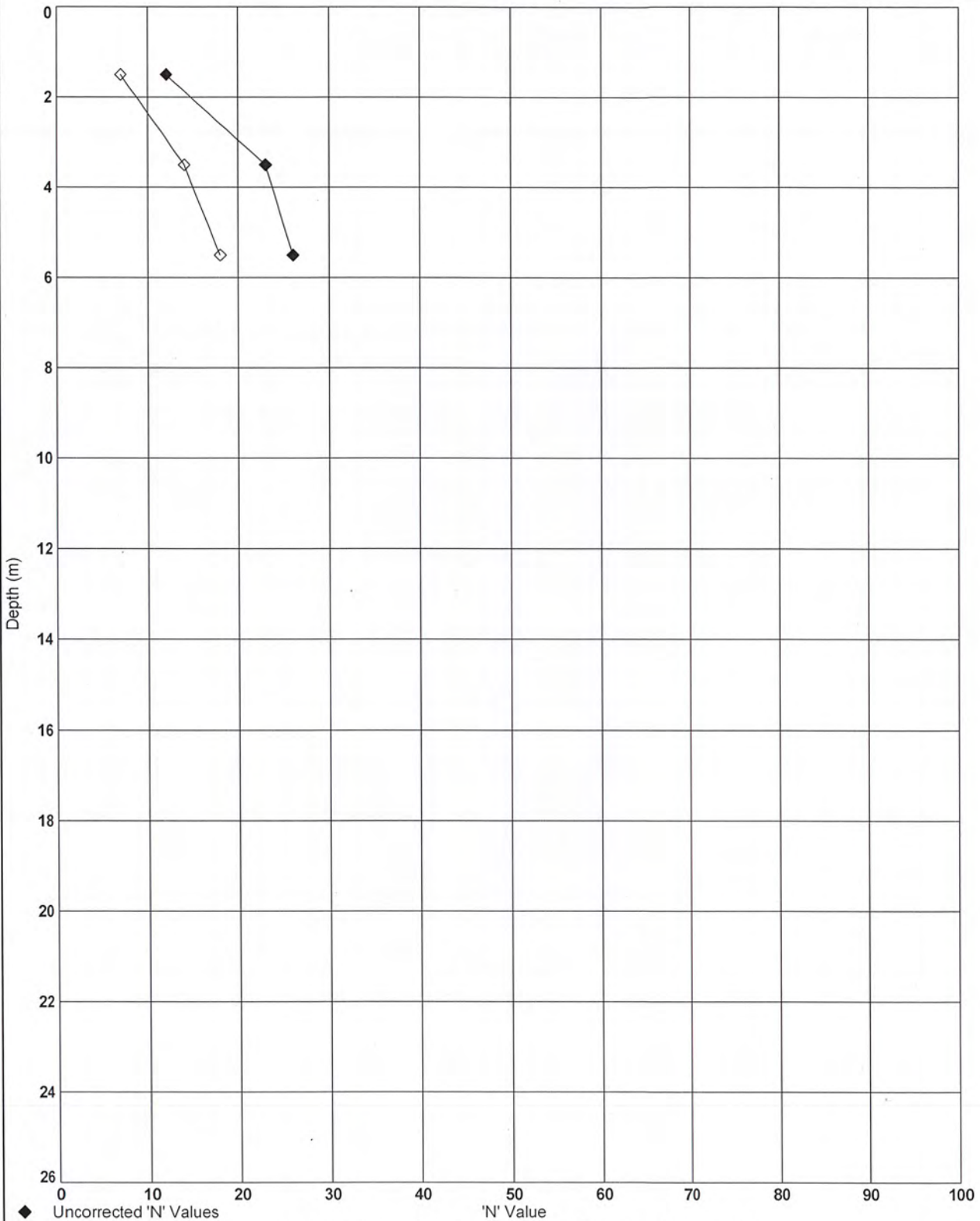
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC017



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC017  
 Approved: [Redacted]

Operator :- K. Roderson  
 AEG Contract No. :- 4322A

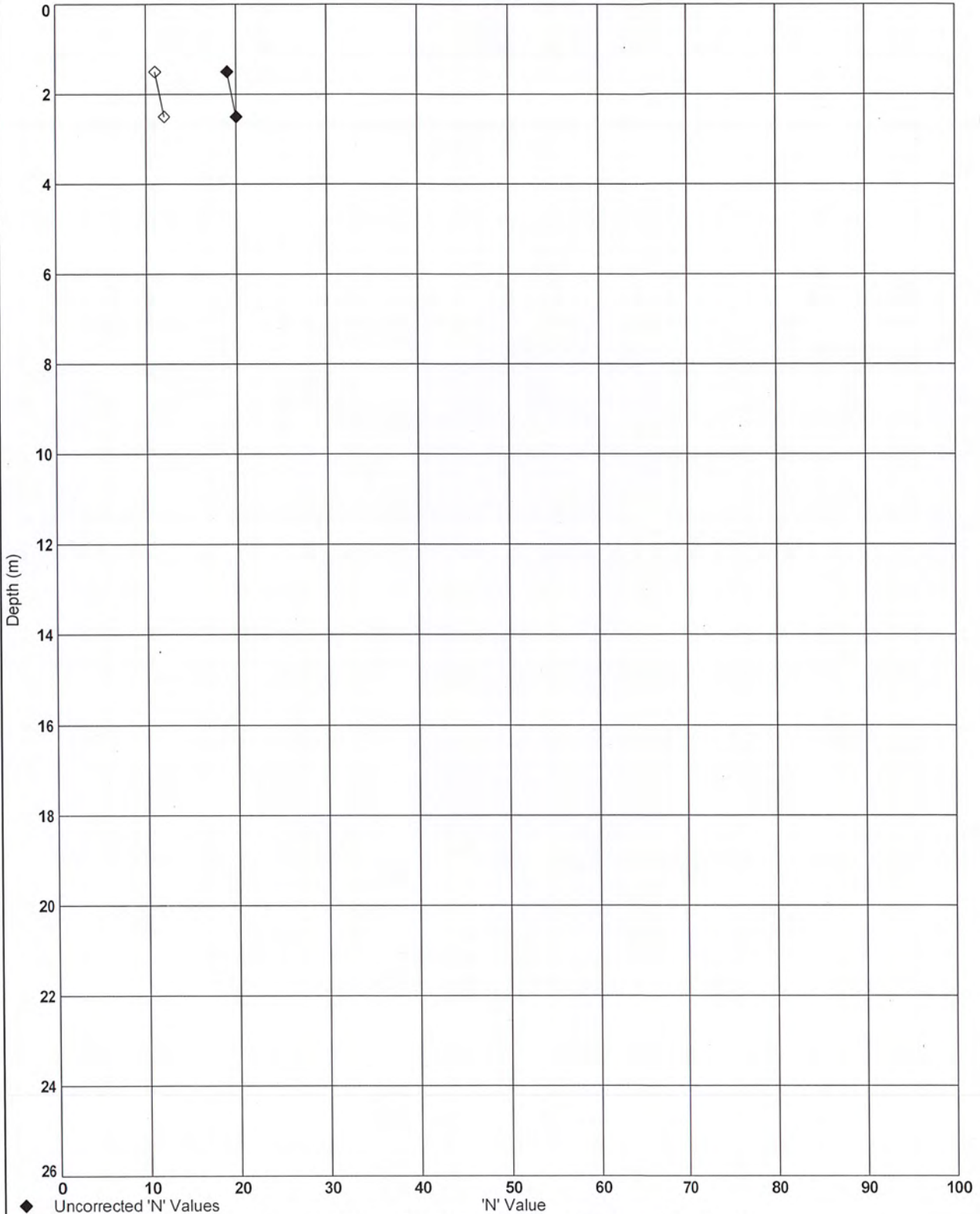




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC018



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC018  
 Approved by: [Redacted]

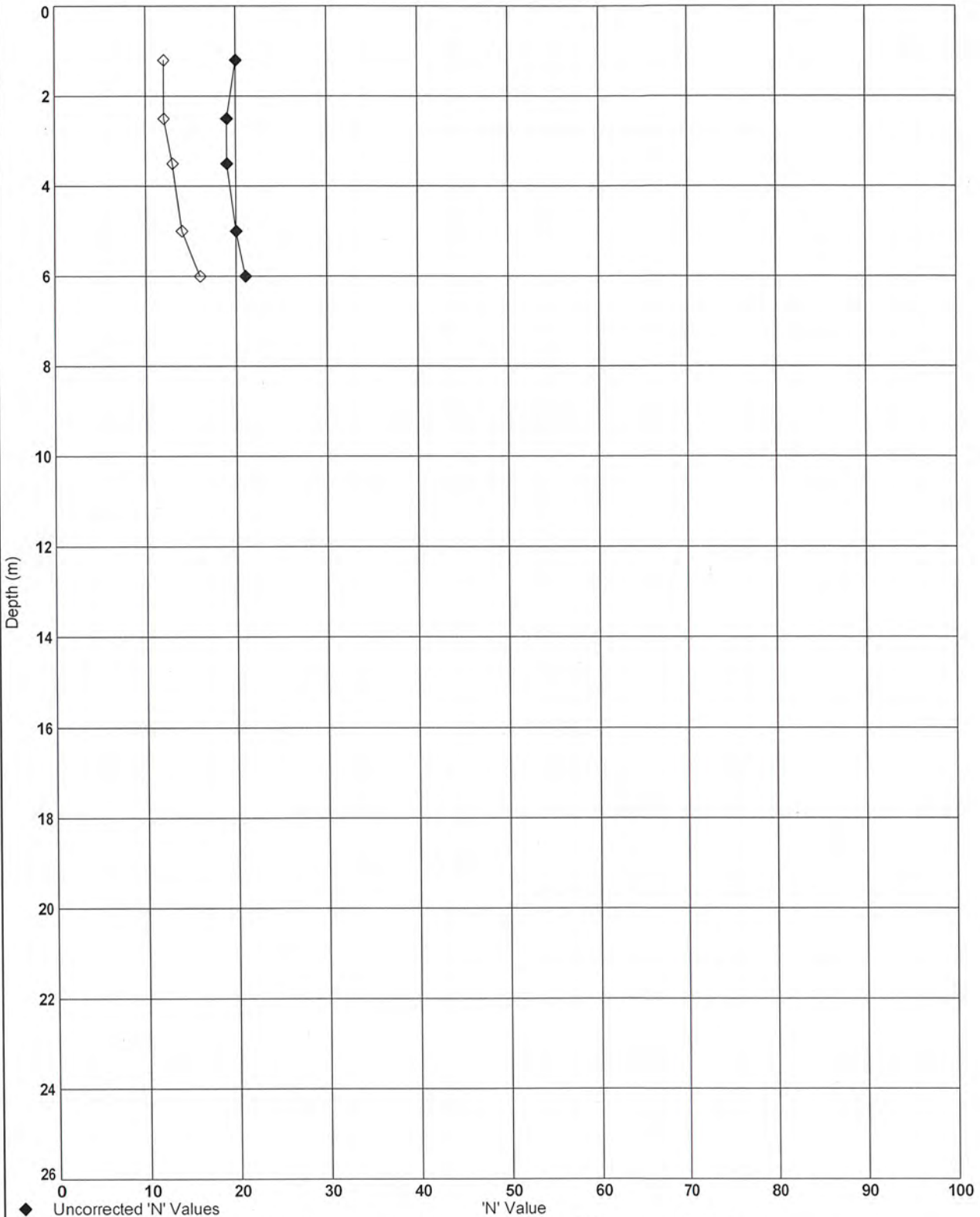
Operator :- K. Roderson  
 AEG Contract No. :- 4322A



## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

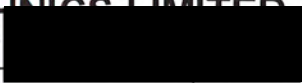
BH SBC019



Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Date of issue :- 26/08/2021	Certificate No :- SPT/4322A/Graph/BH SBC019	Operator :- L. Selkirk	
	Checked by: [Redacted]	Approved by: [Redacted]	AEG Contract No. :- 4322A	

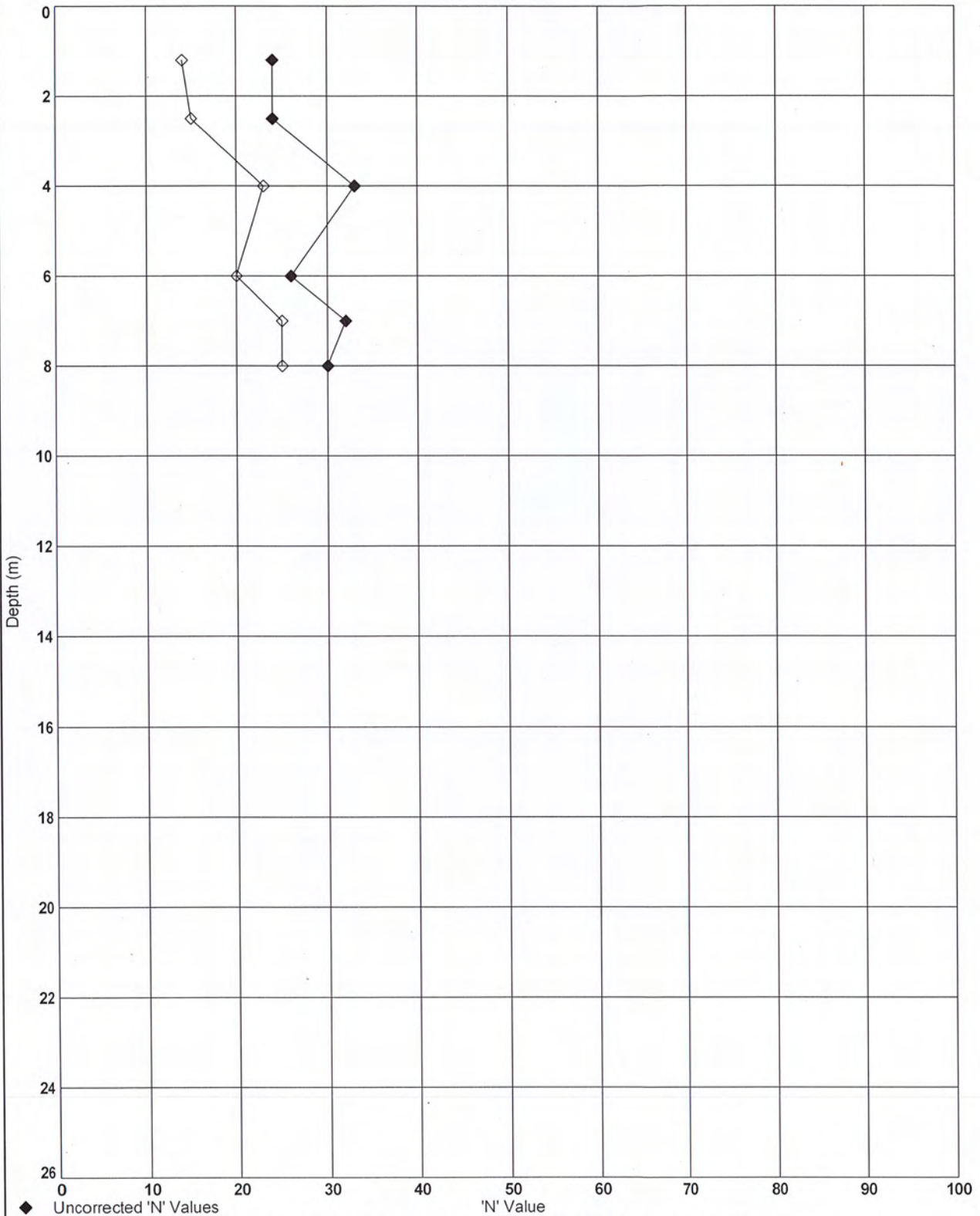




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC020



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021

Certificate No :- SPT/4322A/Graph/BH SBC020

Operator :- L. Selkirk

Checked: [Redacted]

Approved: [Redacted]

AEG Contract No. :- 4322A

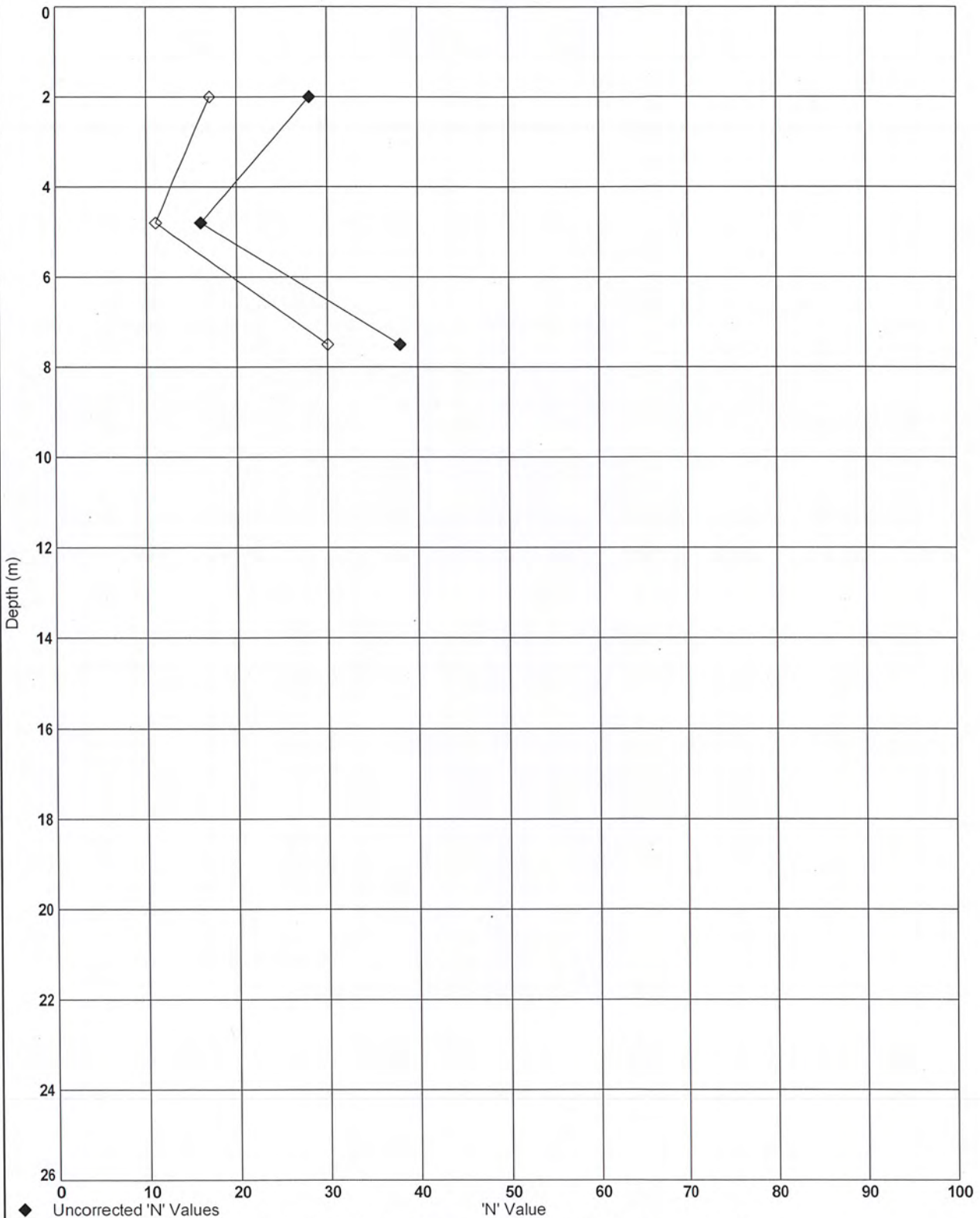




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC021



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC021  
 Approved: [Redacted]

Operator :- T. Quinn  
 AEG Contract No. :- 4322A

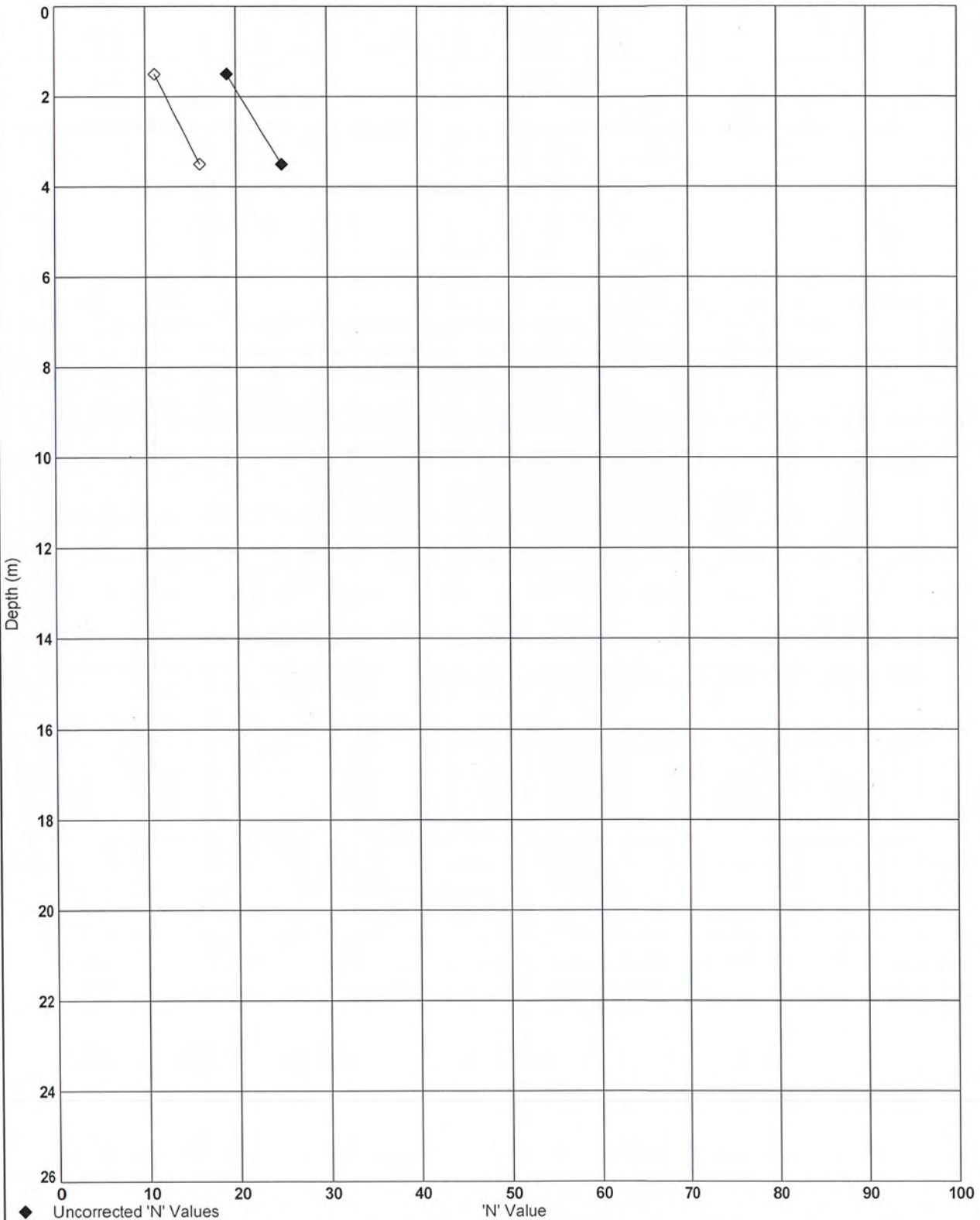




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC022



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC022  
 Approved by: [Redacted]

Operator :- K. Roderson  
 AEG Contract No. :- 4322A

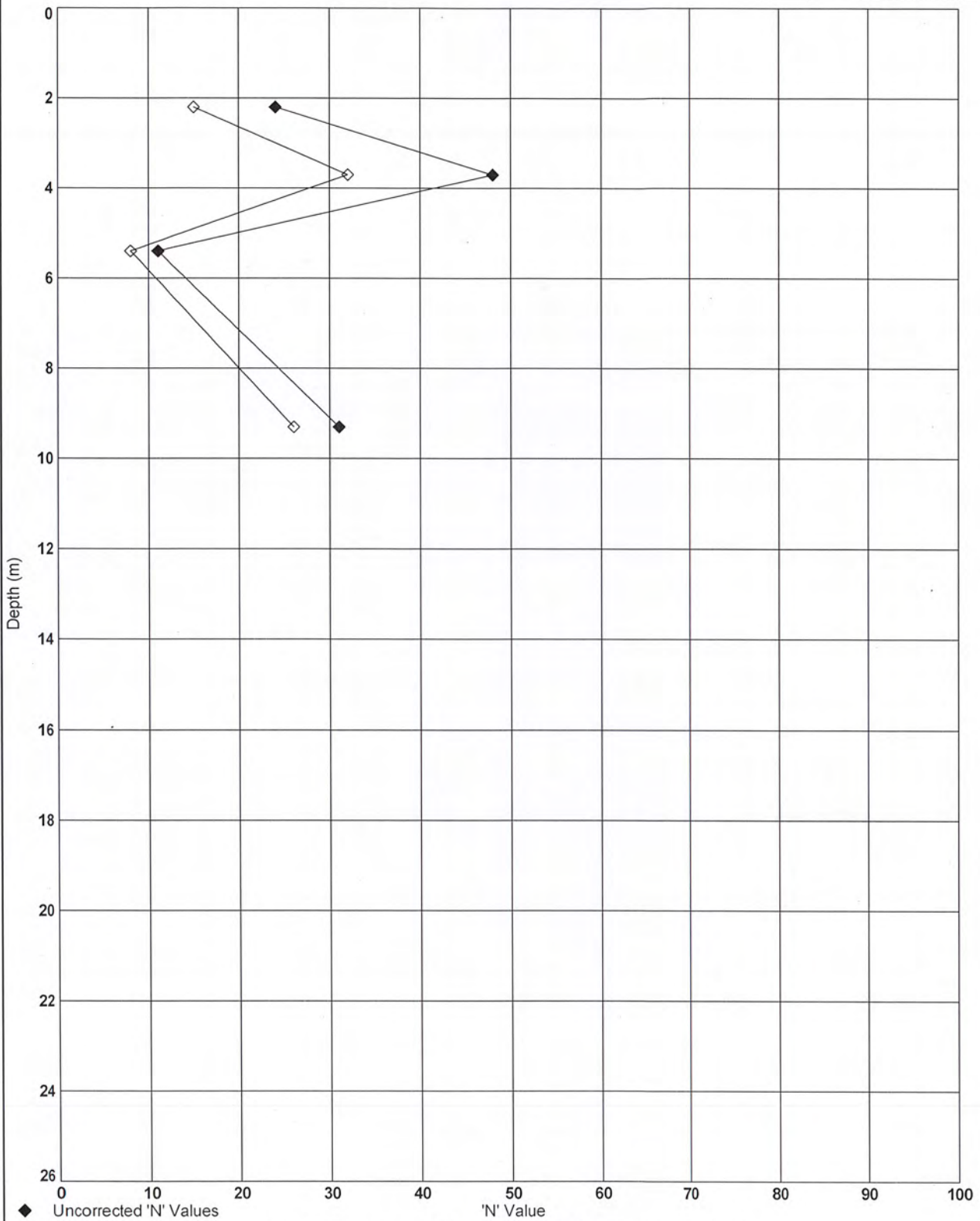




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC023A



◆ Uncorrected 'N' Values      ◇ Corrected 'N' Values      Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC023A  
 Approved: [Redacted]

Operator :- T. Quinn  
 AEG Contract No. :- 4322A

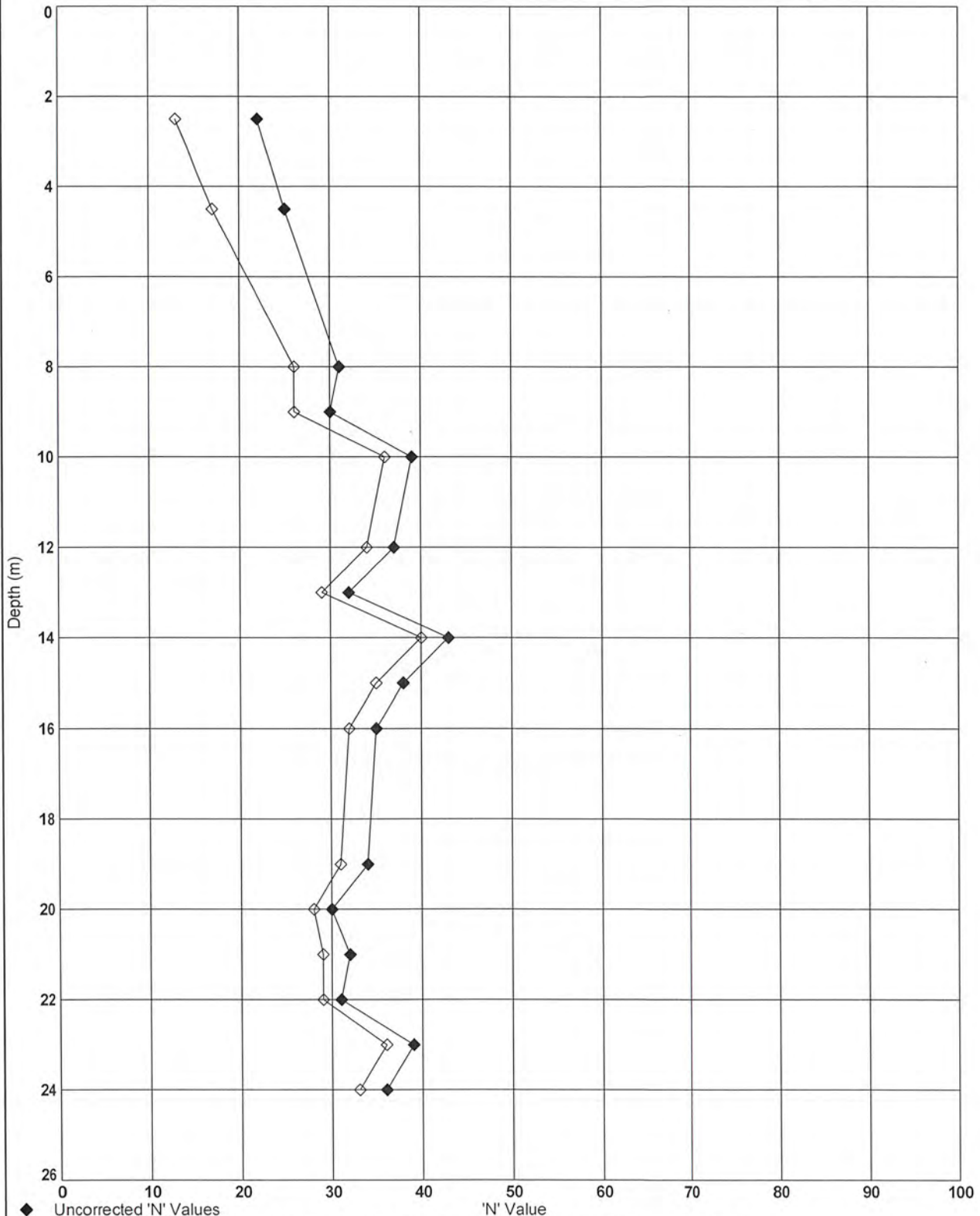




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC024



◆ Uncorrected 'N' Values  
 ◇ Corrected 'N' Values  
 Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021

Certificate No :- SPT/4322A/Graph/BH SBC024

Operator :- K.R./L.H.



Checked [Redacted]

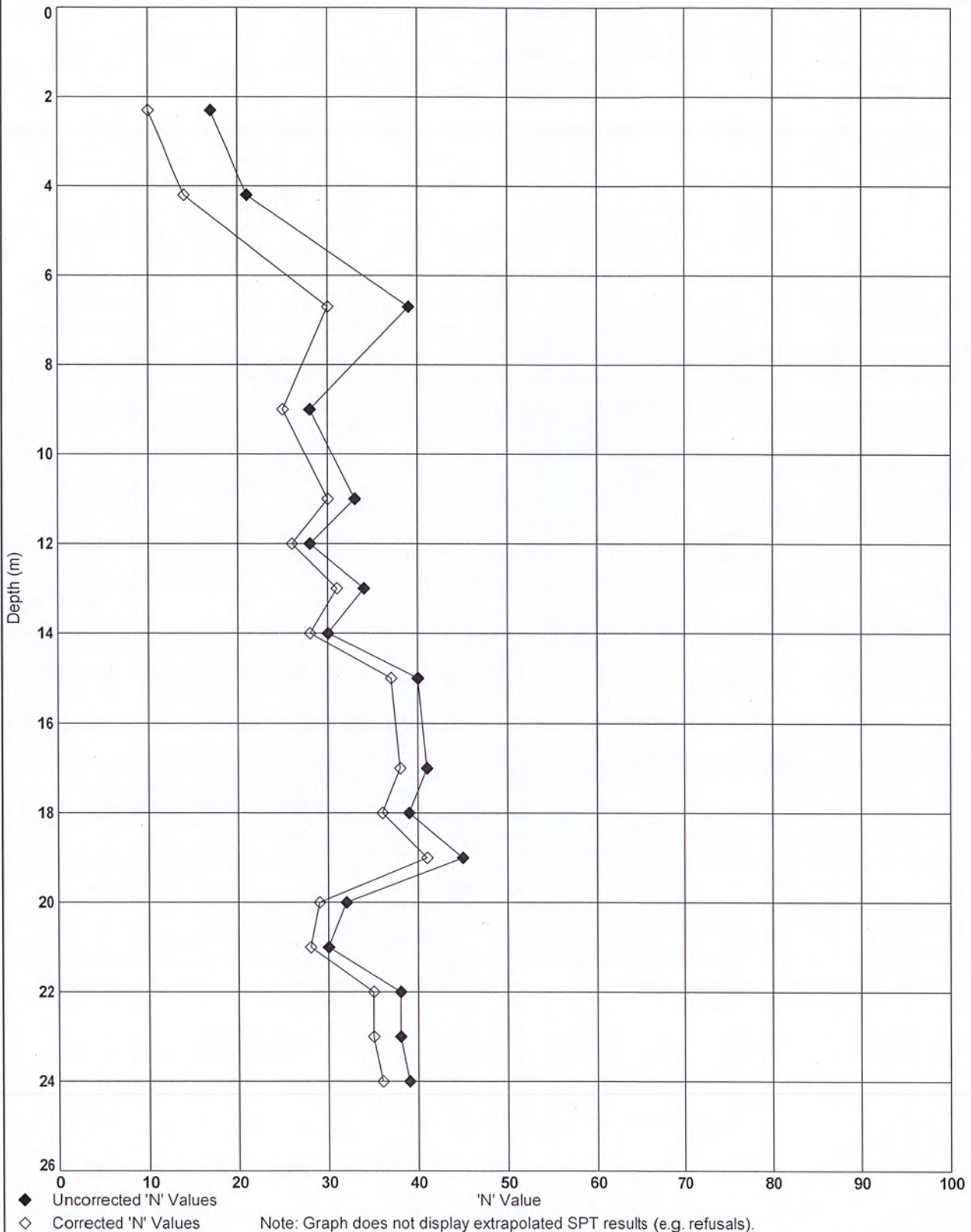
Approved [Redacted]

AEG Contract No. :- 4322A

## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC025



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited

Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC025  
 Approved: [Redacted]

Operator :- T.Q./L.H.  
 AEG Contract No. :- 4322A



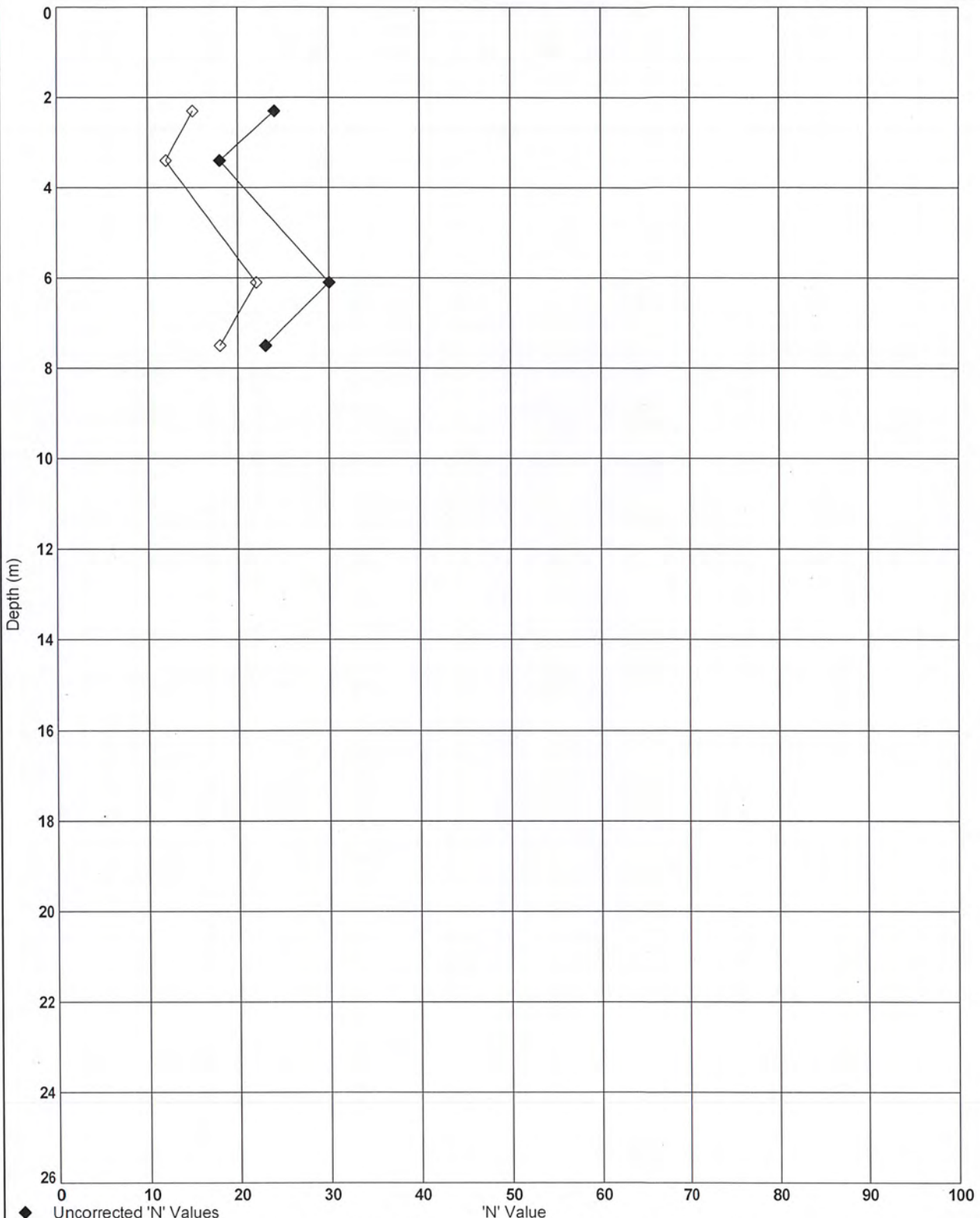




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC026



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC026  
 Approved: [Redacted]

Operator :- T. Quinn  
 AEG Contract No. :- 4322A

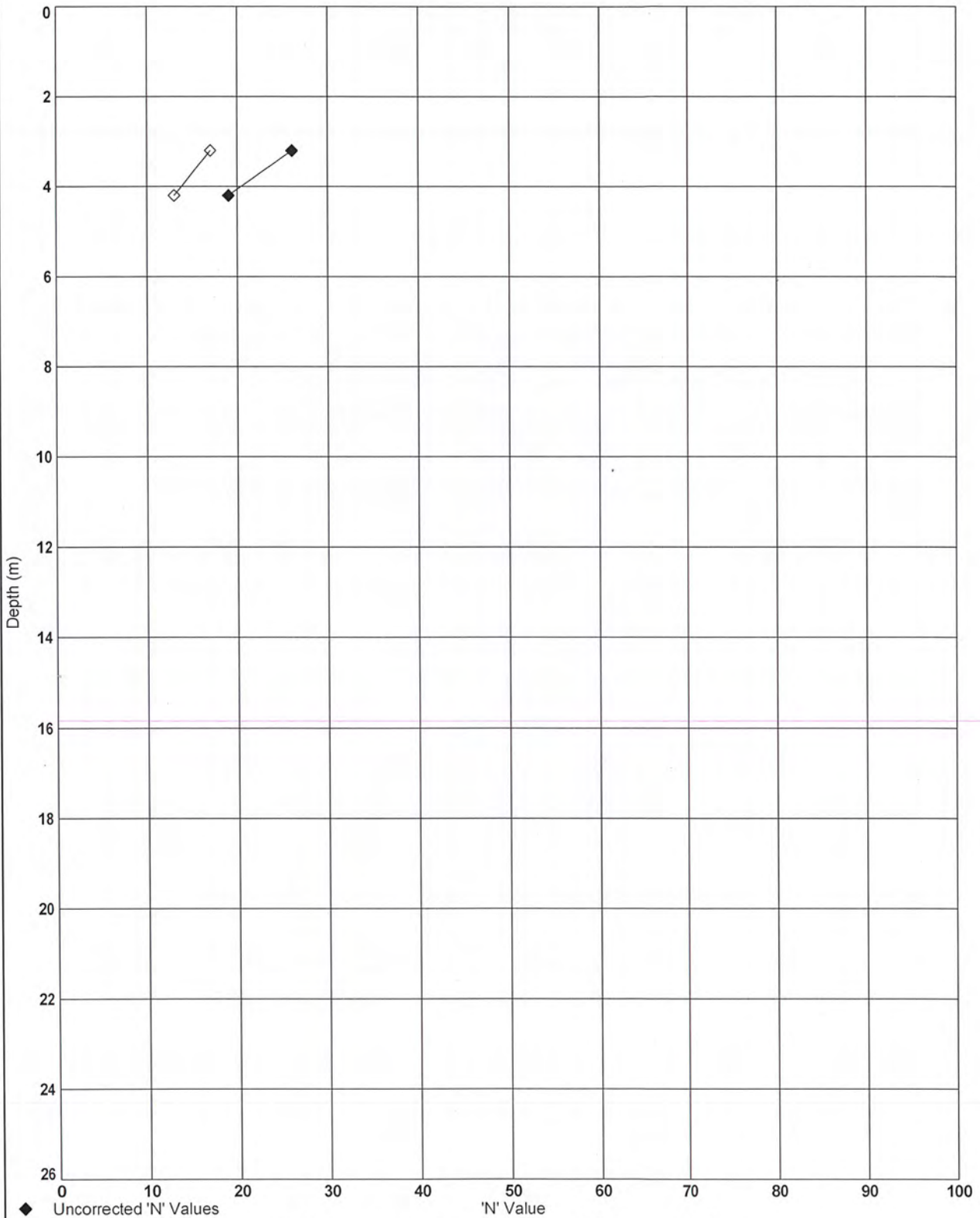




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC027



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021

Certificate No :- SPT/4322A/Graph/BH SBC027

Operator :- T. Quinn

Checked [Redacted]

Approved [Redacted]

AEG Contract No. :- 4322A

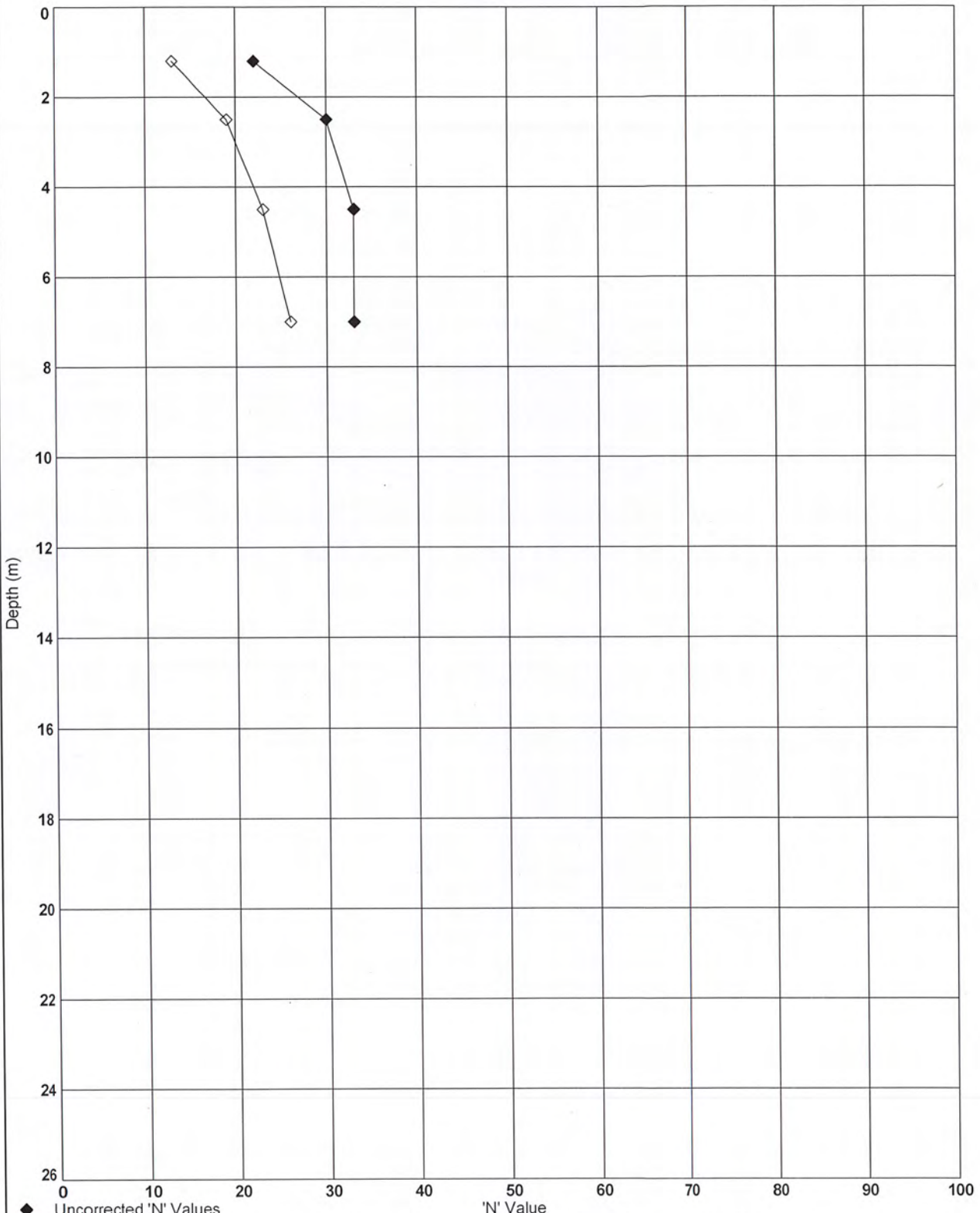




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC028



◆ Uncorrected 'N' Values  
 ◇ Corrected 'N' Values  
 Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC028  
 Approved by: [Redacted]

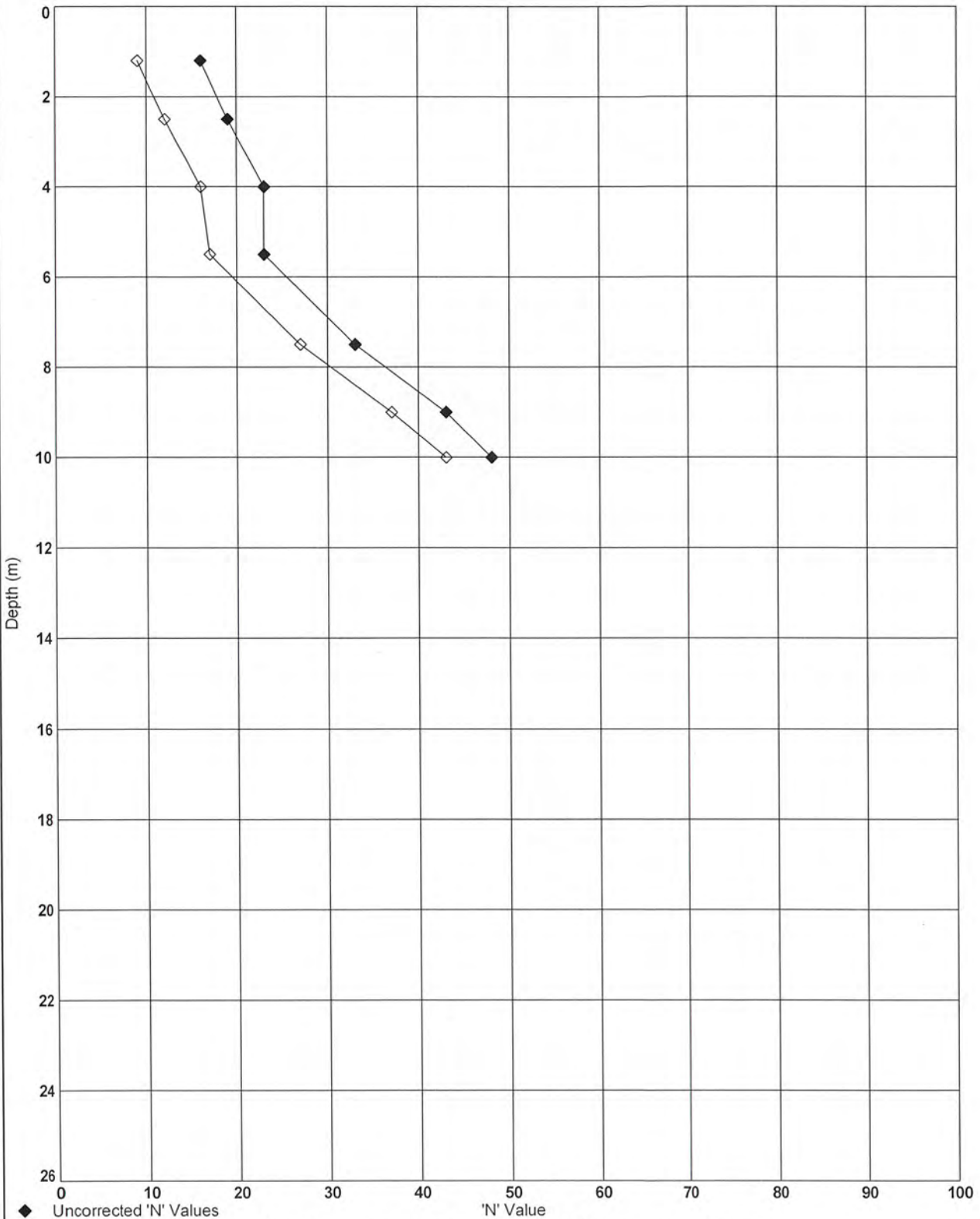
Operator :- L. Selkirk  
 AEG Contract No. :- 4322A



## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC029



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC029  
 Approved by: [Redacted]

Operator :- L. Selkirk  
 AEG Contract No. :- 4322A

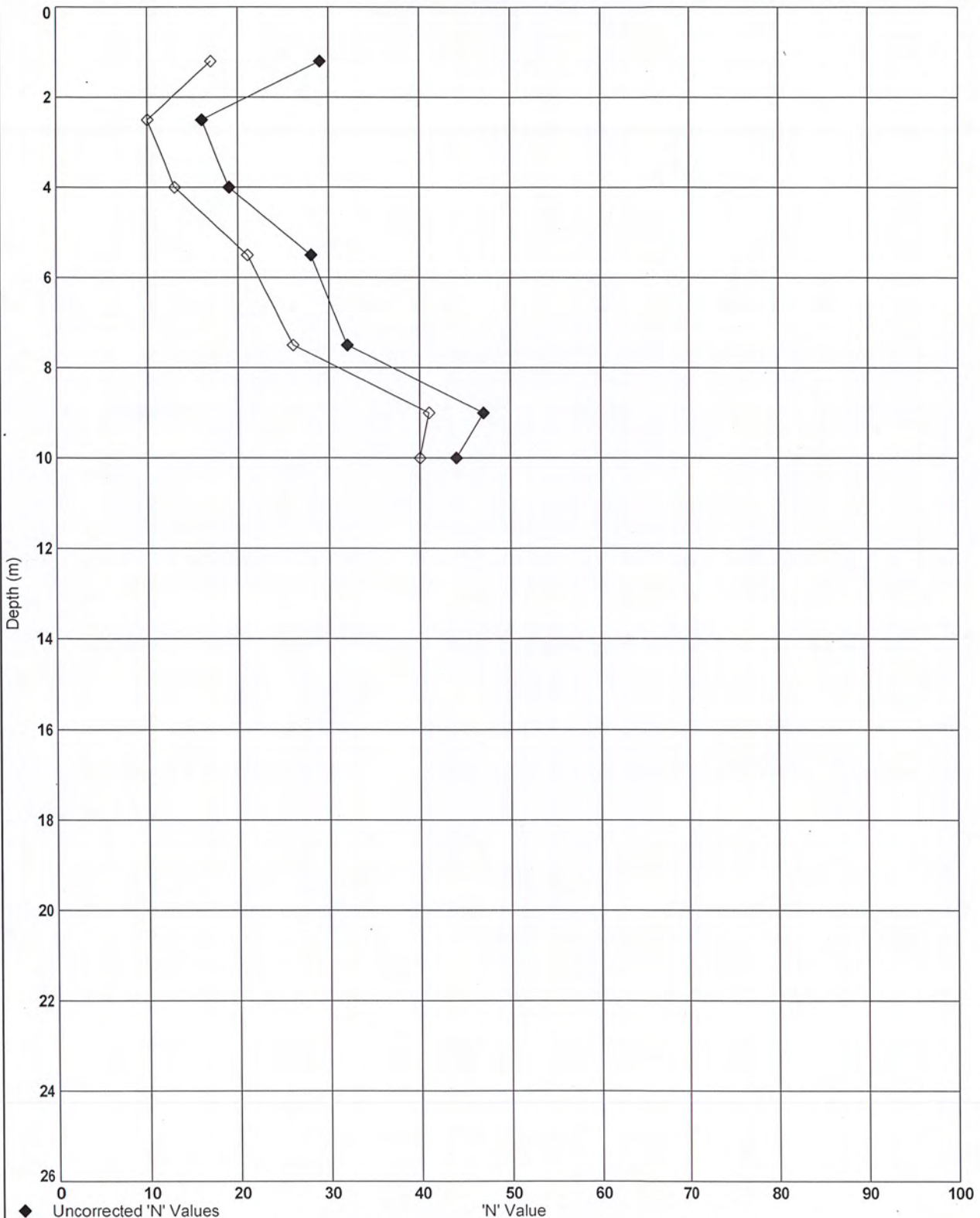




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

**BH SBC030**



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC030  
 Approved: [Redacted]

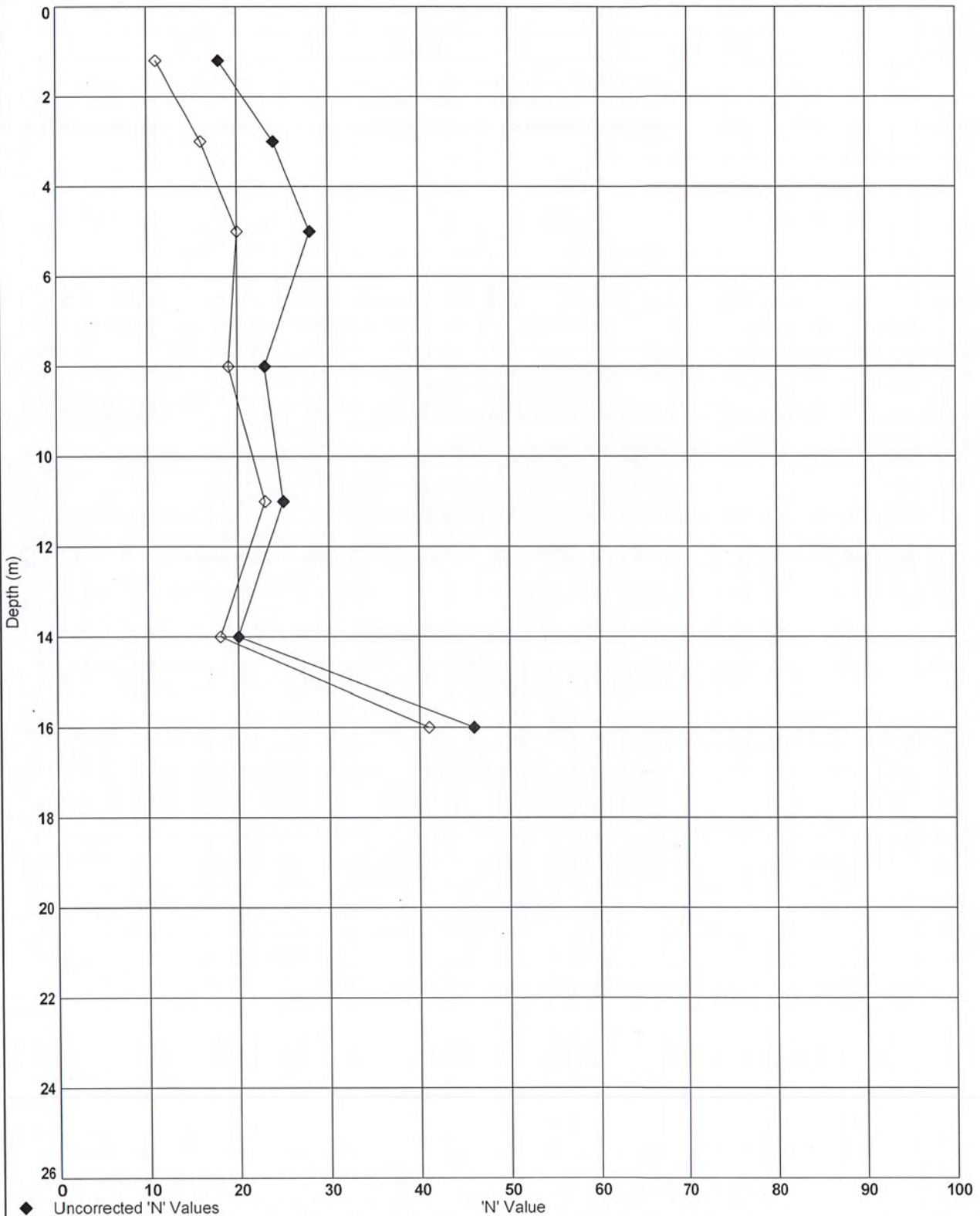
Operator :- L. Selkirk  
 AEG Contract No. :- 4322A



## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC031



Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited

Date of issue :- 26/08/2021

Certificate No :- SPT/4322A/Graph/BH SBC031

Operator :- L. Selkirk

Checked: [Redacted]

Approved: [Redacted]

AEG Contract No. :- 4322A



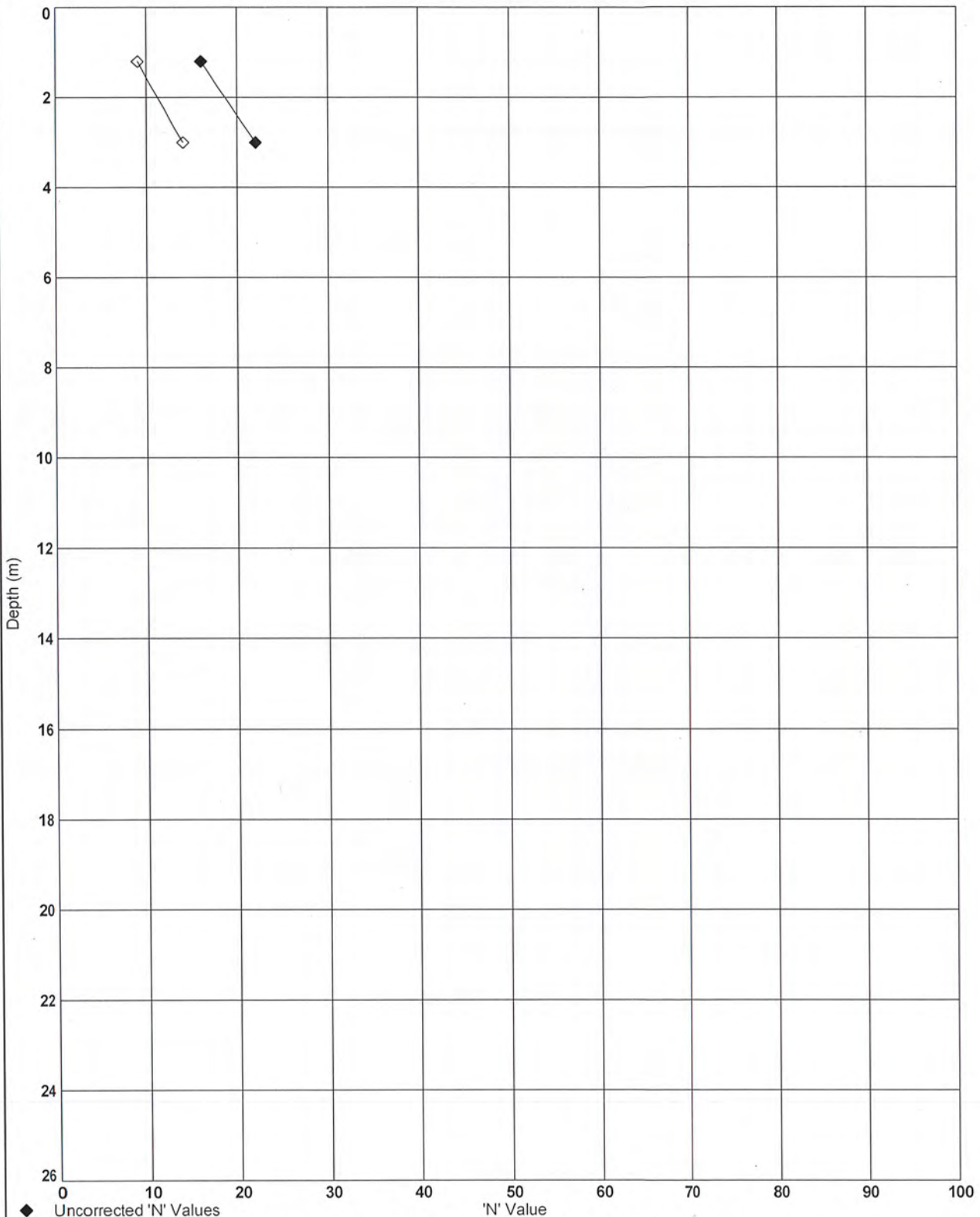




## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC032



Contract Title :- A66 North Trans Pennine Scheme C, Section 9

Client :- AMEY OW Limited



Date of issue :- 26/08/2021  
 Checked by: [Redacted]

Certificate No :- SPT/4322A/Graph/BH SBC032  
 Approved by: [Redacted]

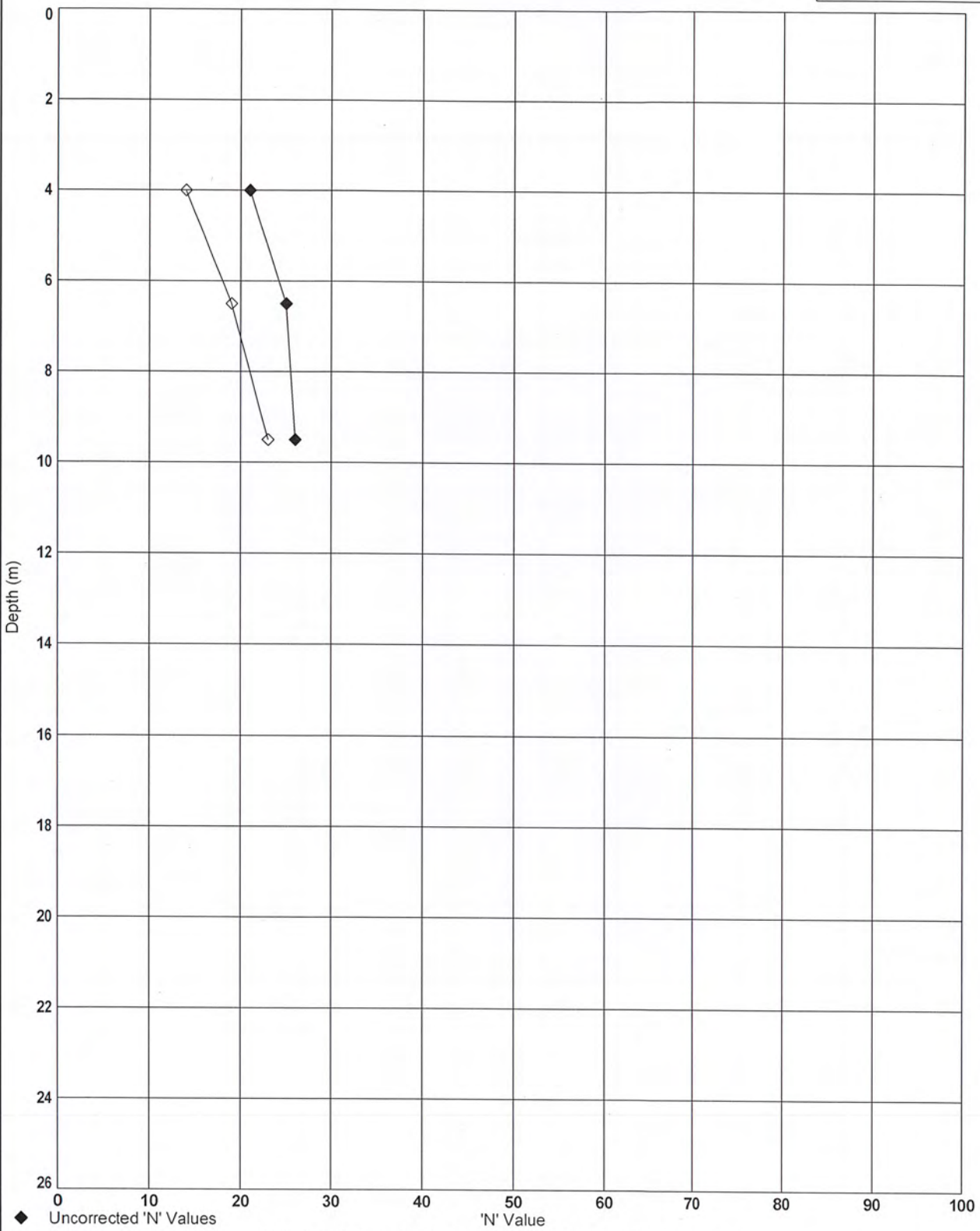
Operator :- L. Selkirk  
 AEG Contract No. :- 4322A



## STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH SBC032A



Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Date of issue :- 26/08/2021	Certificate No :- SPT/4322A/Graph/BH SBC032A	Operator :- L. Selkirk	
	Checked: [Redacted]	Approved: [Redacted]	AEG Contract No. :- 4322A	



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: ATH05  
Test Date: 02/07/2020  
Report Date: 03/07/2020  
File Name: ATH05.sp  
Test Operator: BP

QUALITY CONTROL  
CHECKED  
03 AUG 2020

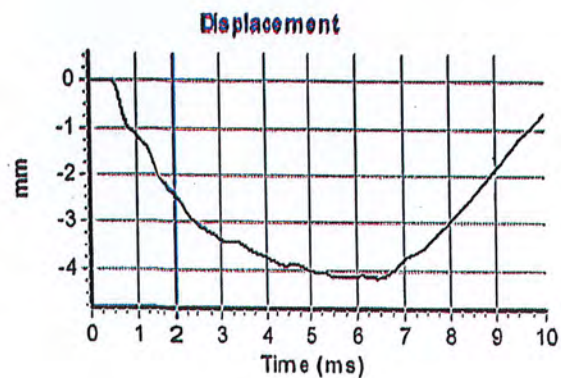
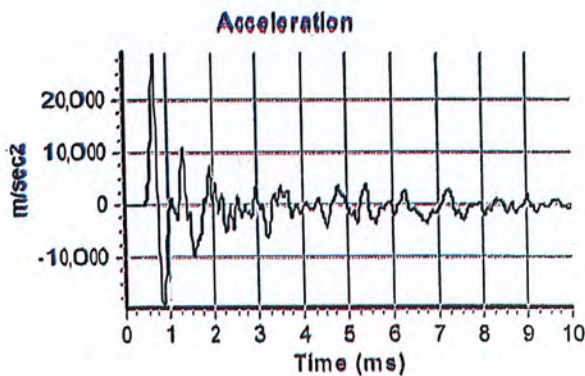
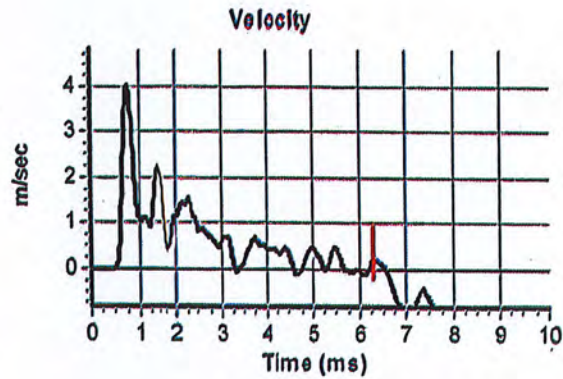
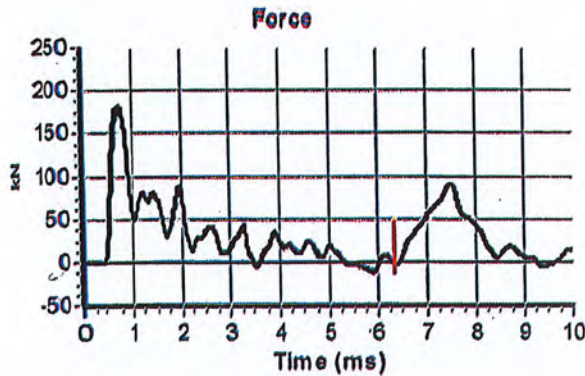
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 11948  
Accelerometer No.2: 6469

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 755  
SPT String Length  $L$  (m): 14.1

### Comments / Location



### Calculations

Area of Rod A ( $\text{mm}^2$ ): 1609  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 279

Energy Ratio  $E_r$  (%): **59**

Signed: Brian Proctor  
Title: Senior Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: ATH06  
Test Date: 02/07/2020  
Report Date: 03/07/2020  
File Name: ATH06.spt  
Test Operator: BP

QUALITY CONTROL  
CHECKED  
03 AUG 2020

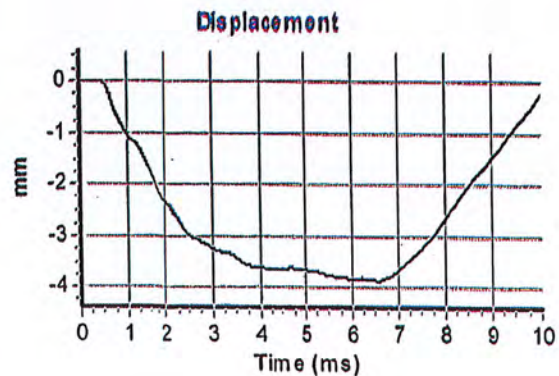
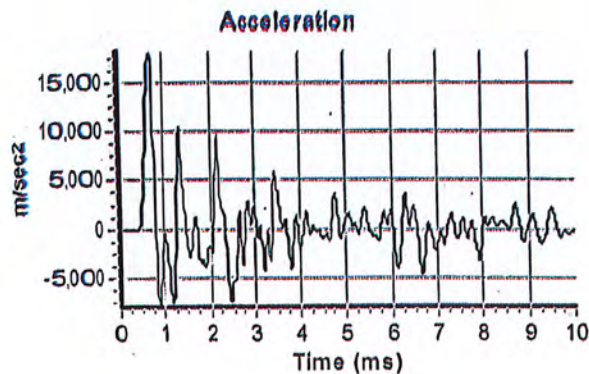
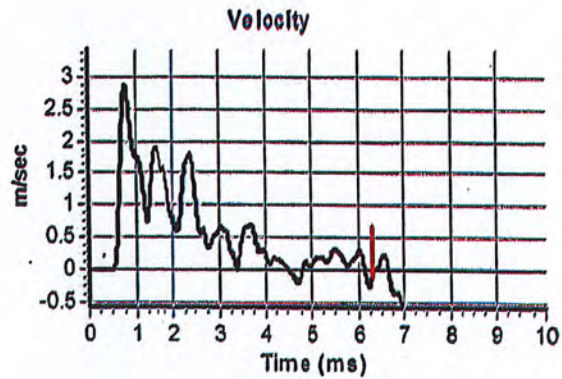
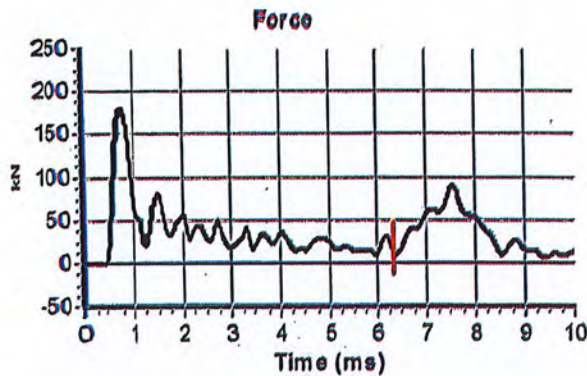
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 11948  
Accelerometer No.2: 6469

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.4  
Falling Height  $h$  (mm): 762  
SPT String Length  $L$  (m): 14.1

### Comments / Location



### Calculations

Area of Rod A ( $\text{mm}^2$ ): 1609  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 240

Energy Ratio  $E_r$  (%): **51**

Signed: Brian Proctor  
Title: Senior Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH22RG

SPT Hammer Ref: ATH07  
Test Date: 06/02/2021  
Report Date: 08/02/2021  
File Name: ATH07.spt  
Test Operator: BP

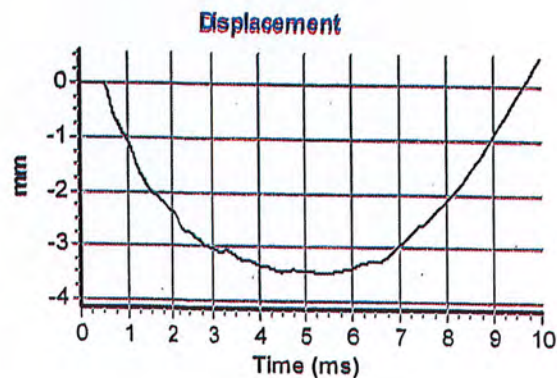
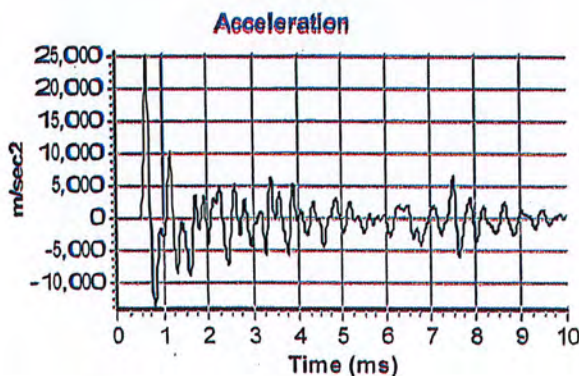
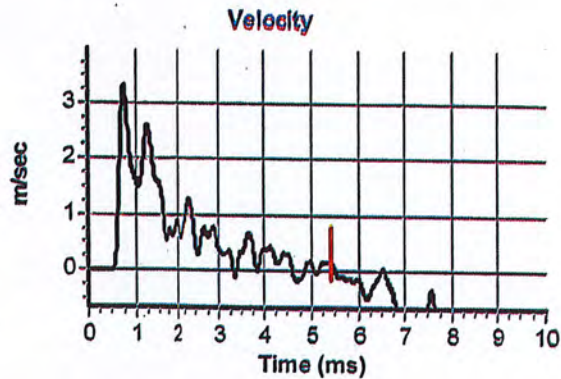
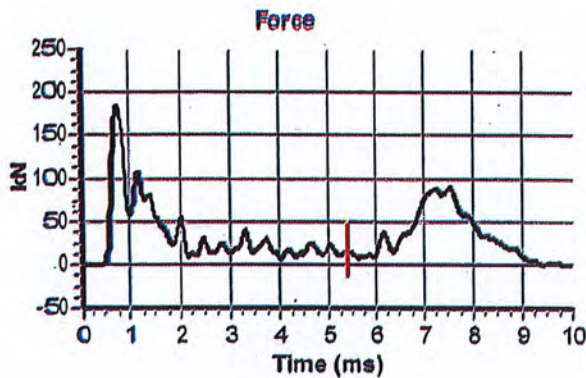
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 65939  
Accelerometer No.2: 66286

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.2  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 14.1

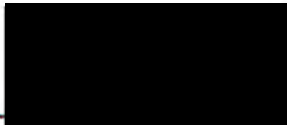
### Comments / Location



### Calculations

Area of Rod A ( $\text{mm}^2$ ): 1609  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 256

**Energy Ratio  $E_r$  (%):** 54

Signed:   
Title: Senior Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: ATH09  
Test Date: 14/07/2020  
Report Date: 14/07/2020  
File Name: ATH09.spt  
Test Operator: BP

QUALITY CONTROL  
CHECKED  
03 AUG 2020

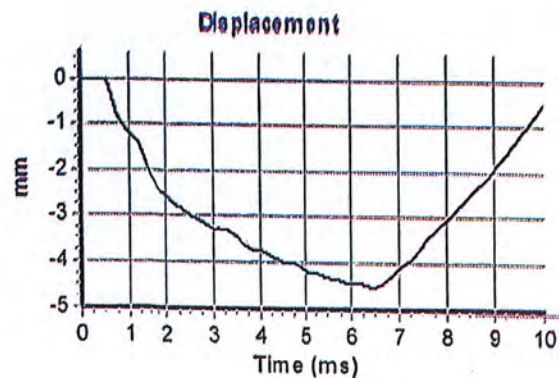
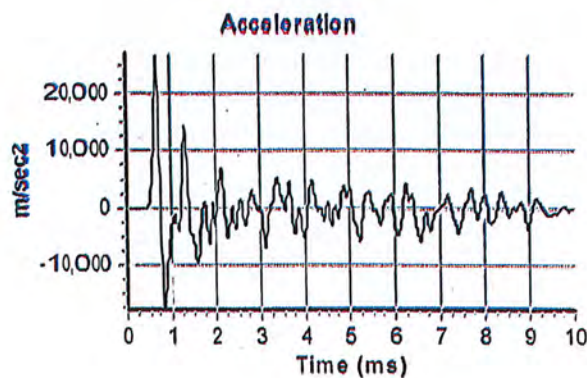
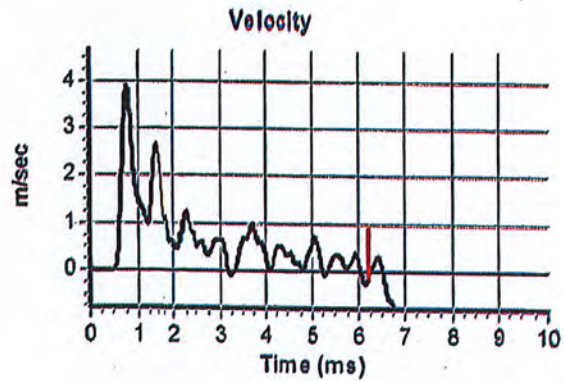
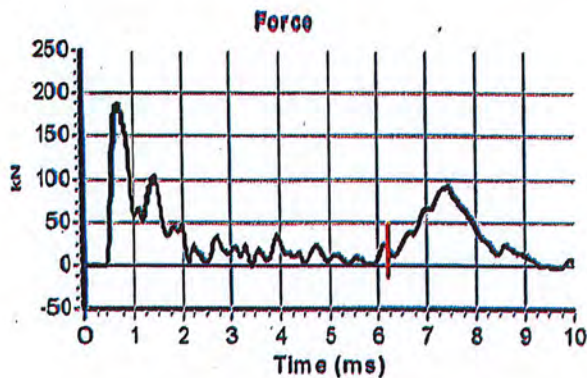
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 11948  
Accelerometer No.2: 6469

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 14.1

### Comments / Location



### Calculations

Area of Rod  $A$  (mm<sup>2</sup>): 1609  
Theoretical Energy  $E_{theor}$  (J): 473  
Measured Energy  $E_{meas}$  (J): 259

Energy Ratio  $E_r$  (%):

55

*B Proctor*  
Signed: Brian Proctor  
Title: Senior Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: DP04  
Test Date: 08/07/2020  
Report Date: 14/07/2020  
File Name: DP04.spt  
Test Operator: BP

QUALITY CONTROL  
CHECKED

03 AUG 2020

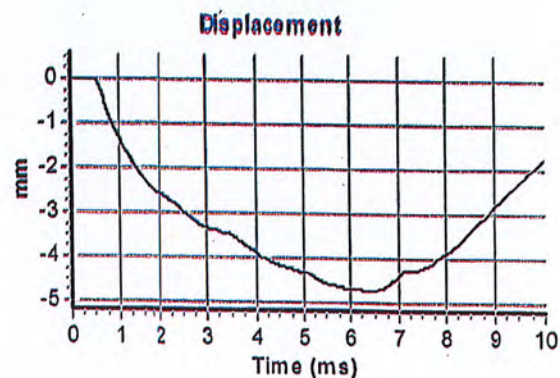
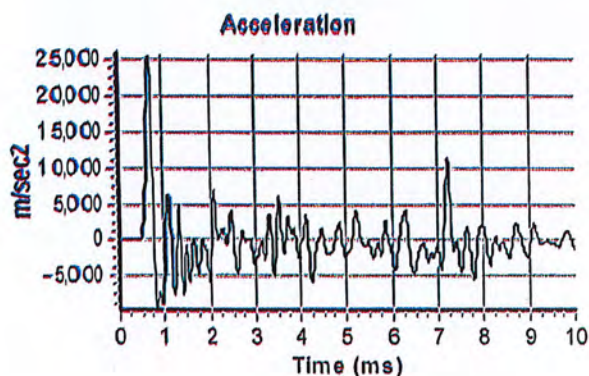
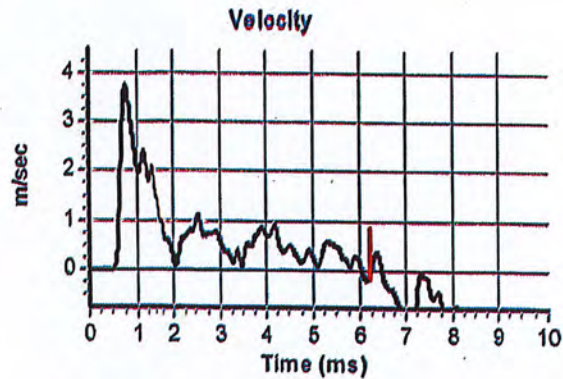
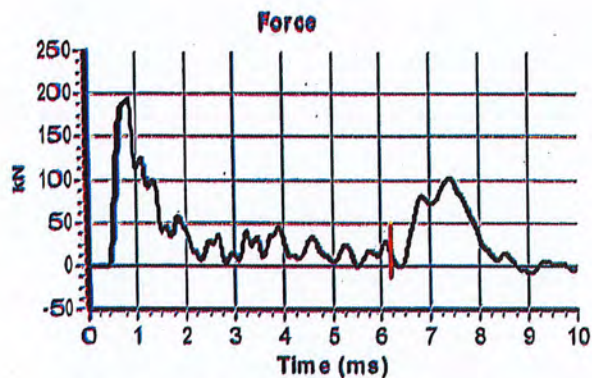
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 11948  
Accelerometer No.2: 6469

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 14.1

### Comments / Location



### Calculations

Area of Rod A (mm<sup>2</sup>): 1609  
Theoretical Energy  $E_{theor}$  (J): 473  
Measured Energy  $E_{meas}$  (J): 346

Energy Ratio  $E_r$  (%):

73

Signed: Brian Proctor  
Title: Senior Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: R07  
Test Date: 21/02/2020  
Report Date: 21/02/2020  
File Name: R07.spt  
Test Operator: BP

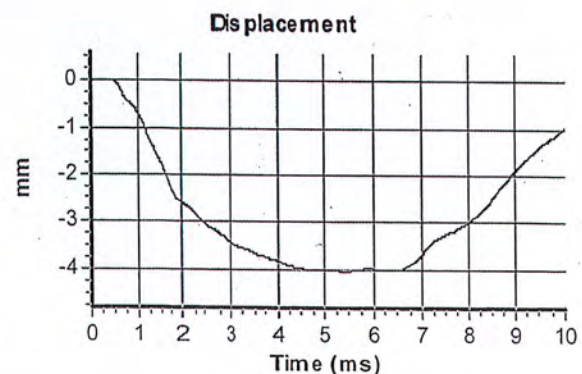
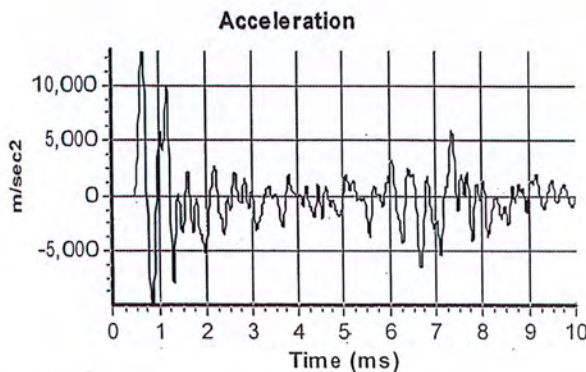
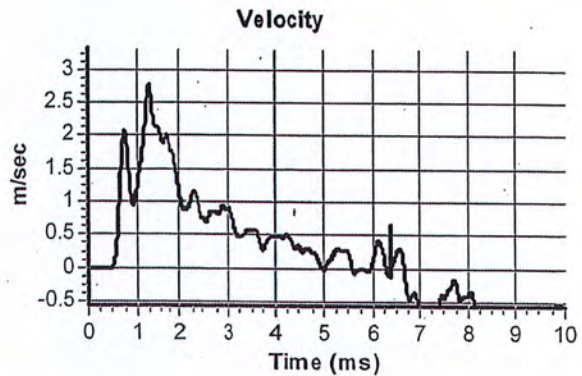
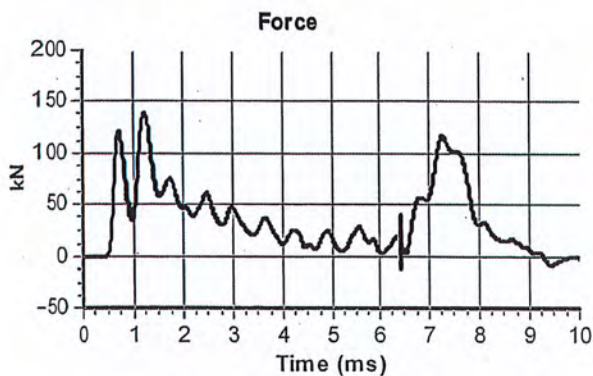
### Instrumented Rod Data

Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 11406  
Accelerometer No.2: 6469

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.4  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 13.5

### Comments / Location



### Calculations

Area of Rod A (mm<sup>2</sup>): 1609  
Theoretical Energy  $E_{theor}$  (J): 473  
Measured Energy  $E_{meas}$  (J): 307

**Energy Ratio  $E_r$  (%):** 65

Signed: Brian Proctor  
Title: Technician

The recommended calibration interval is 12 months



Unit 25 Stella Gill Industrial Estate  
Pelton Fell  
Chester-le-Street  
DH2 2RG

SPT Hammer Ref: TQ2  
Test Date: 22/12/2020  
Report Date: 22/12/2020  
File Name: TQ2.spt  
Test Operator: BP

### Instrumented Rod Data

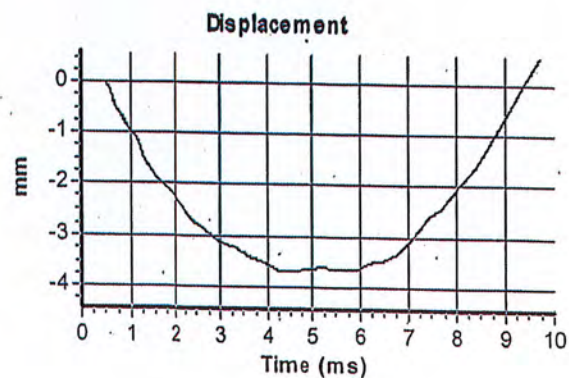
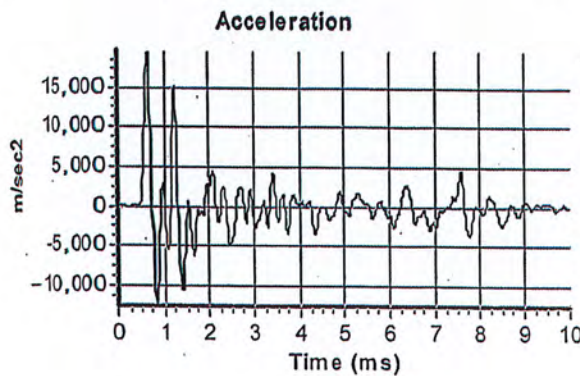
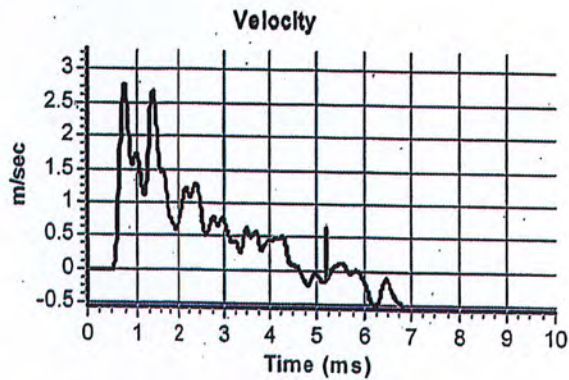
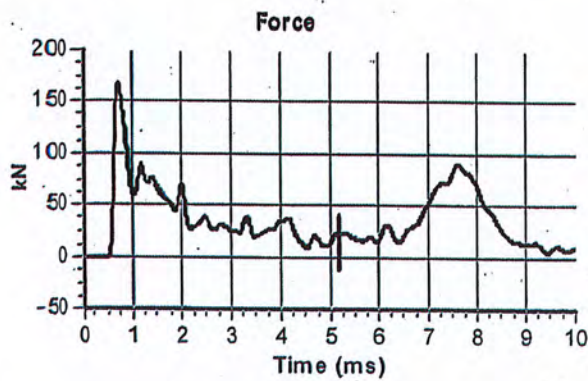
Diameter  $d_r$  (mm): 67  
Wall Thickness  $t_r$  (mm): 8.8  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 65939  
Accelerometer No.2: 66286

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 14.1

### Comments / Location

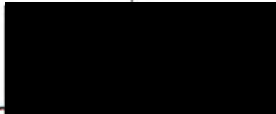
Mass and drop supplied by client



### Calculations

Area of Rod A (mm<sup>2</sup>): 1609  
Theoretical Energy  $E_{theor}$  (J): 473  
Measured Energy  $E_{meas}$  (J): 250

**Energy Ratio  $E_r$  (%):** 53

Signed:  Brian Proctor  
Title: Senior Technician

The recommended calibration interval is 12 months

## Hand Shear Vane Test Results





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
BH SBC005	01/03/2021	0.60	38 (22)	42 (22)	36 (20)	39 (21)	
BH SBC007	02/03/2021	0.60	38 (22)	36 (20)	36 (20)	37 (21)	
BH SBC009	01/03/2021	0.60	38 (22)	40 (20)	36 (20)	38 (21)	
BH SBC014A	26/02/2021	0.60	38 (20)	36 (18)	36 (20)	37 (19)	
BH SBC019	09/03/2021	0.60	38 (22)	40 (20)	36 (20)	38 (21)	
BH SBC020	09/03/2021	0.60	36 (20)	38 (22)	38 (22)	37 (21)	
TP SBC002	26/02/2021	0.50	70 (25)	41 (31)	42 (27)	51 (28)	
TP SBC002	26/02/2021	1.00	51 (26)	73 (25)	61 (25)	62 (25)	
TP SBC003	26/02/2021	0.40	52 (28)	49 (28)	36 (16)	46 (24)	
TP SBC003	26/02/2021	1.00	104 (38)	88 (33)	74 (32)	89 (34)	
TP SBC003	26/02/2021	2.00	50 (45)	48 (25)	40 (15)	46 (28)	
TP SBC004	26/02/2021	0.50	120 (110)	120 (101)	120 (83)	120 (98)	>120kPa

Residual results given in brackets.

<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9	<b>Client :-</b> AMEY OW Limited	<b>AEG Contract No :-</b> 4322A
<b>Date of issue :-</b> 26/08/2021	<b>Page No. :-</b> 1 of 6	<b>Certificate No. :-</b> HSV/4322A/1



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20 Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
TP SBC005	25/02/2021	0.50	50 (22)	60 (30)	60 (32)	57 (28)	
TP SBC007	22/02/2021	1.00	78 (18)	84 (32)	82 (28)	81 (26)	
TP SBC008	23/02/2021	0.50	58 (31)	64 (31)	60 (32)	61 (31)	
TP SBC009	22/02/2021	1.00	110 (66)	108 (62)	114 (66)	111 (65)	
TP SBC010	23/02/2021	0.50	70 (38)	64 (28)	66 (34)	67 (33)	
TP SBC011	23/02/2021	0.50	56 (18)	48 (16)	54 (18)	53 (17)	
TP SBC011	23/02/2021	1.50	56 (18)	70 (22)	66 (22)	64 (21)	
TP SBC012	23/02/2021	0.50	64 (30)	72 (30)	70 (26)	69 (29)	
TP SBC012A	24/02/2021	0.60	55 (16)	58 (18)	50 (16)	54 (17)	
TP SBC012A	24/02/2021	4.00	88 (40)	80 (36)	84 (42)	84 (39)	
TP SBC014	24/02/2021	2.80	88 (32)	80 (26)	88 (28)	85 (29)	
TP SBC017	01/03/2021	0.50	64 (28)	84 (36)	88 (34)	79 (33)	

Residual results given in brackets.

<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9	<b>Client :-</b> AMEY OW Limited	<b>AEG Contract No :-</b> 4322A
<b>Date of issue :-</b> 26/08/2021	<b>Page No. :-</b> 2 of 6	<b>Certificate No. :-</b> HSV/4322A/2





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: [REDACTED]  
 Unit 25 Stella Gill Industrial Estate, Felton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: [REDACTED]  
 Unit 20 Business Development Centre, Easingham Wharf, Blackbourn, BB1 5BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
TP SBC017	01/03/2021	3.00	98 (38)	104 (40)	116 (38)	106 (39)	
TP SBC017	01/03/2021	4.00	108 (38)	110 (44)	108 (42)	109 (41)	
TP SBC017	01/03/2021	5.00	118 (42)	128 (44)	106 (38)	117 (41)	
TP SBC018	01/03/2021	0.50	78 (26)	84 (24)	88 (32)	83 (27)	
TP SBC018	01/03/2021	3.50	98 (40)	116 (46)	104 (38)	106 (41)	
TP SBC019	02/03/2021	0.40	70 (28)	64 (26)	82 (30)	72 (28)	
TP SBC019	02/03/2021	4.00	98 (42)	104 (40)	92 (40)	98 (41)	
TP SBC020	02/03/2021	0.50	74 (28)	64 (26)	80 (26)	73 (27)	
TP SBC021	02/03/2021	0.50	76 (26)	82 (26)	70 (26)	76 (26)	
TP SBC021	02/03/2021	3.50	98 (38)	114 (42)	98 (36)	103 (39)	
TP SBC024	24/02/2021	0.50	68 (30)	52 (24)	56 (26)	59 (27)	
TP SBC025	24/02/2021	0.50	58 (26)	52 (24)	70 (42)	60 (31)	

Residual results given in brackets.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Client :- AMEY OW Limited		AEG Contract No :- 4322A
	Date of Issue :- 26/09/2021	Page No. :- 3 of 6	[REDACTED]		Certificate No. :- HSV/4322A/3

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Felton Fell, Chester-le-Street, Co. Durham, DH2 2FG  
 Regional Office: Unit 20 Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
TP SBC026	24/02/2021	0.50	40 (28)	58 (30)	48 (18)	49 (25)	
TP SBC026	24/02/2021	1.50	50 (30)	48 (25)	50 (32)	49 (29)	
TP SBC027	25/02/2021	0.50	80 (45)	86 (40)	90 (50)	85 (45)	
TP SBC028	25/02/2021	0.80	112 (48)	98 (42)	96 (44)	102 (45)	
TP SBC028	25/02/2021	3.50	122 (40)	128 (38)	116 (44)	122 (41)	
TP SBC028	25/02/2021	4.00	112 (48)	126 (44)	118 (40)	119 (44)	
TP SBC029	25/02/2021	0.50	82 (36)	94 (42)	84 (38)	87 (39)	
TP SBC029	25/02/2021	3.50	118 (42)	122 (46)	106 (40)	115 (43)	
TP SBC030	04/03/2021	0.50	86 (32)	88 (36)	84 (34)	86 (34)	
TP SBC030	04/03/2021	4.00	114 (38)	102 (34)	106 (36)	107 (36)	
TP SBC031	26/02/2021	0.40	88 (40)	96 (44)	108 (44)	97 (43)	
TP SBC031	26/02/2021	3.50	120 (42)	128 (46)	118 (40)	122 (43)	

Residual results given in brackets.

	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	Client :-	AMEY OW Limited	AEG Contract No :-	4322A
	Date of issue :-	26/08/2021	Page No. :-	4 of 6	Certificate No. :-	HSV/4322A/4




# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: [REDACTED]  
 Unit 25 Stella Gill Industrial Estate, Felton Fell, Chester-le-Street, Co. Durham, DH2 2FG  
 Regional Office: [REDACTED]  
 Unit 20 Business Development Centre, Eanan Wharf, Blackburn, BB1 3BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
TP SBC032	26/02/2021	0.60	88 (38)	118 (44)	114 (40)	107 (41)	
TP SBC032	26/02/2021	3.50	124 (48)	118 (44)	>130	121 (46)	>130kPa
TP SBC033	26/02/2021	0.50	84 (36)	72 (30)	70 (26)	75 (31)	
TP SBC033	26/02/2021	2.50	112 (38)	120 (46)	126 (42)	119 (42)	
TP SBC035	04/03/2021	0.60	88 (38)	88 (40)	92 (38)	89 (39)	
TP SBC035	04/03/2021	1.20	76 (32)	84 (36)	84 (34)	81 (34)	
TP SBC040	08/03/2021	0.80	48 (23)	52 (26)	54 (24)	51 (24)	
TP SBC040	08/03/2021	1.80	44 (21)	48 (26)	58 (27)	50 (25)	
TP SBC040	08/03/2021	2.80	79 (32)	82 (40)	81 (40)	81 (37)	
TP SBC042	03/03/2021	0.50	74 (26)	66 (22)	78 (26)	73 (25)	
TP SBC042	03/03/2021	3.50	94 (38)	110 (36)	104 (36)	103 (37)	
TP SBC043	05/03/2021	0.50	74 (26)	82 (28)	70 (24)	75 (26)	

Residual results given in brackets.

	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Client :- AMEY OW Limited		AEG Contract No :- 4322A
	Date of Issue :- 26/08/2021		Page No. :- 5 of 6		Certificate No. :- HSV/4322A/5

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
TP SBC043	05/03/2021	3.50	62 (28)	54 (22)	60 (24)	58 (25)	
TP SBC043	05/03/2021	4.00	52 (20)	56 (18)	56 (20)	55 (19)	
TP SBC043	05/03/2021	4.80	82 (30)	84 (28)	70 (24)	79 (27)	
TP SBC044	08/03/2021	4.50	88 (41)	92 (44)	96 (44)	92 (43)	

Residual results given in brackets.



Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited

AEG Contract No :-

4322A

Date of issue :-

26/08/2021

Page No. :-

6 of 6

Certificate No. :-

HSV/4322A/6



## Variable Head Permeability Test Results



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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Falling Head      Test No: 1 of 1

**Contract & Position Details**

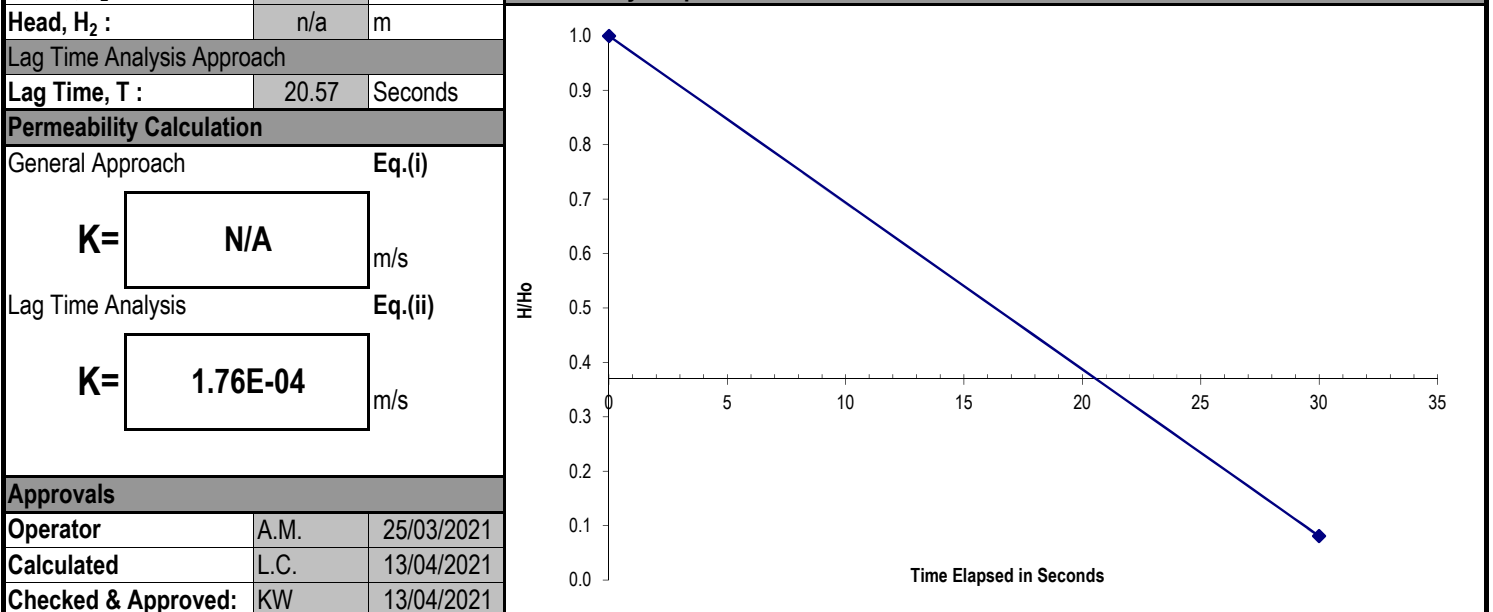
Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC001      Depth (mBGL): 2.00

Initial Conditions			Intake Factor Selection		Comments
Parameter	Value	Unit	Option	Criteria	
Top of Section:	1.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	(1) Refer to Exploratory Hole Record for soil conditions. (2) Water level noted as dry at the start of test. Initial water level taken as 1.55m BGL for the purpose of the calculation - this is the maximum depth that dip meter could reach due to a kink/obstruction in the pipe.
Base of Section:	3.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	140.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.15	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	1.55	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast		<input checked="" type="radio"/> G	Standpipe or Piezometer	

**Initial Response Zone Calculations      Readings**

Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	2.00	m	0	0	0	-0.150	1.85	1.000	
Diameter, D:	0.14	m	0	30	30	1.550	0.15	0.081	
L/D:	14.29	Ratio							
Response Area, A:	0.0154	m <sup>2</sup>							
Intake Factor, F:	4.2557	Coefficient							
using $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$									
<b>Permeability Equations</b>									
General Approach									
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)									
Lag Time Analysis									
$K = \frac{A}{F \cdot T}$ Eq.(ii)									
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37									
<b>Permeability Variable Determination</b>									
General Approach									
Factor, T <sub>1</sub> :	n/a	Seconds							
Head, H <sub>1</sub> :	n/a	m							
Factor, T <sub>2</sub> :	n/a	Seconds							
Head, H <sub>2</sub> :	n/a	m							

**Permeability Graph**



**Permeability Calculation**

General Approach      Eq.(i)		
K =	N/A	m/s
Lag Time Analysis      Eq.(ii)		
K =	1.76E-04	m/s

**Approvals**

Operator	A.M.	25/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



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Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**  
**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

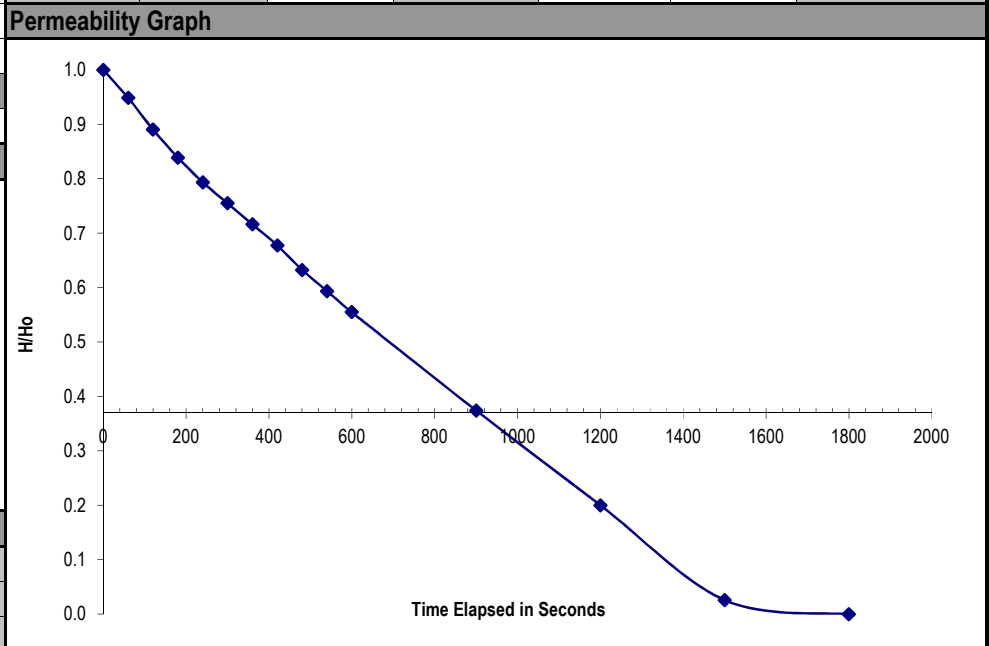
**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC005      Depth (mBGL): 3.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	2.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	3.50	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	1.27	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast/Sunny		<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	1.50	m	0	0	0	2.820	1.55	1.000	
Diameter, D:	0.15	m	1	0	60	2.740	1.47	0.948	
L/D:	10.00	Ratio	2	0	120	2.650	1.38	0.890	
Response Area, A:	0.0177	m <sup>2</sup>	3	0	180	2.570	1.30	0.839	
Intake Factor, F:	3.5615	Coefficient	4	0	240	2.500	1.23	0.794	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			5	0	300	2.440	1.17	0.755	
<b>Permeability Equations</b>			6	0	360	2.380	1.11	0.716	
General Approach			7	0	420	2.320	1.05	0.677	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			8	0	480	2.250	0.98	0.632	
Lag Time Analysis			9	0	540	2.190	0.92	0.594	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			10	0	600	2.130	0.86	0.555	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			15	0	900	1.850	0.58	0.374	
			20	0	1200	1.580	0.31	0.200	
			25	0	1500	1.310	0.04	0.026	
			30	0	1800	1.270	0.00	0.000	
<b>Permeability Variable Determination</b>									
General Approach									
Factor, T <sub>1</sub> :	n/a	Seconds							
Head, H <sub>1</sub> :	n/a	m							
Factor, T <sub>2</sub> :	n/a	Seconds							
Head, H <sub>2</sub> :	n/a	m							

Permeability Graph		
Lag Time Analysis Approach		
Lag Time, T :	907.22	Seconds
<b>Permeability Calculation</b>		
General Approach      Eq.(i)		
K =	N/A	m/s
Lag Time Analysis      Eq.(ii)		
K =	5.47E-06	m/s
<b>Approvals</b>		
Operator	A.M.	25/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



**VARIABLE HEAD PERMEABILITY TEST CALCULATION**  
**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 50mm Standpipe      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
 Contract : 4322A      Exploratory Hole: BH SBC006      Depth (mBGL): 7.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Top of Section:	5.00	mBGL	Option	Criteria	
Base of Section:	7.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Diameter of Section:	92.00	mm	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Measurement Offset:	0.00	mAGL	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Standpipe Diameter:	50.00	mm	<input type="radio"/> D	Well point or hole extended in uniform soil	
Initial Water Level:	3.46	mBGL	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Weather Conditions:	Overcast/Sunny		<input type="radio"/> F	Soil in casing with bottom in uniform soil	
			<input checked="" type="radio"/> G	Standpipe or Piezometer	

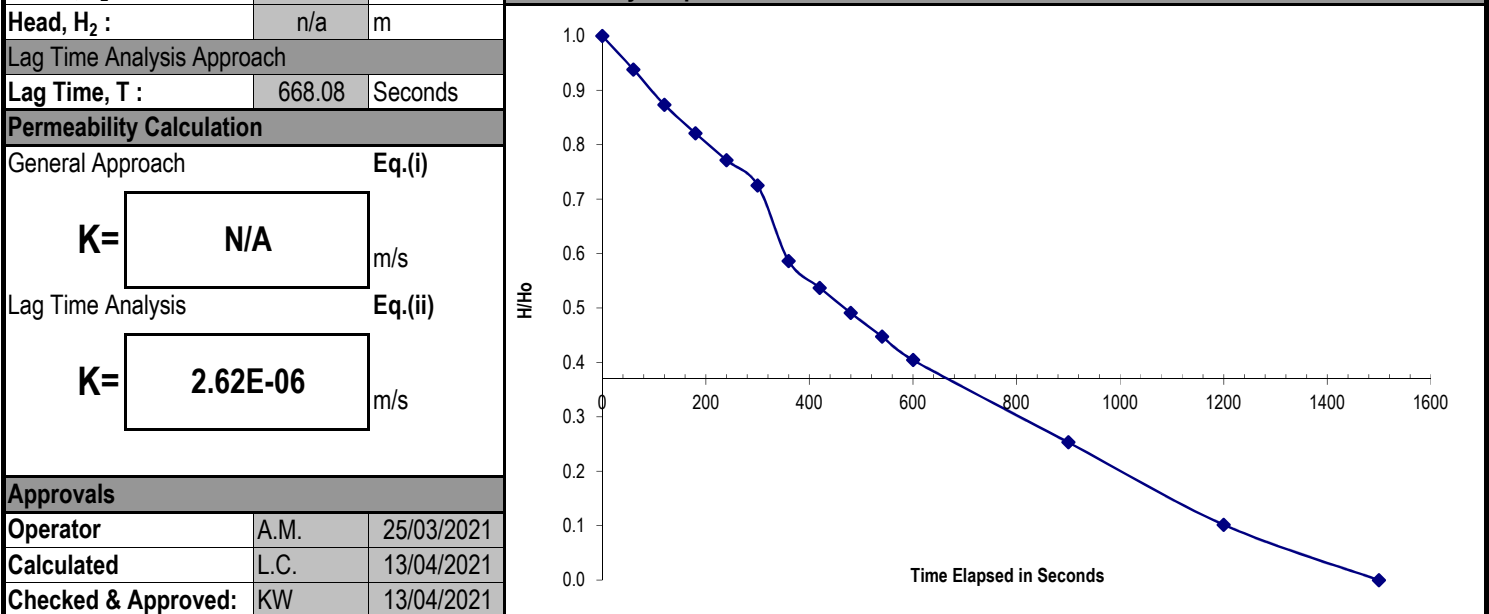
**Initial Response Zone Calculations      Readings**

Initial Response Zone Calculations			Readings						
Length, L:	2.00	m	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Diameter, D:	0.09	m	0	0	0	6.700	3.24	1.000	
L/D:	21.74	Ratio	1	0	60	6.500	3.04	0.938	
Response Area, A:	0.0066	m <sup>2</sup>	2	0	120	6.290	2.83	0.873	
Intake Factor, F:	3.7917	Coefficient	3	0	180	6.120	2.66	0.821	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			4	0	240	5.960	2.50	0.772	
<b>Permeability Equations</b>			5	0	300	5.810	2.35	0.725	
General Approach			6	0	360	5.360	1.90	0.586	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			7	0	420	5.200	1.74	0.537	
Lag Time Analysis			8	0	480	5.050	1.59	0.491	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			9	0	540	4.910	1.45	0.448	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			10	0	600	4.770	1.31	0.404	
			15	0	900	4.280	0.82	0.253	
			20	0	1200	3.790	0.33	0.102	
			25	0	1500	3.460	0.00	0.000	

**Permeability Variable Determination**

General Approach		
Factor, T <sub>1</sub> :	n/a	Seconds
Head, H <sub>1</sub> :	n/a	m
Factor, T <sub>2</sub> :	n/a	Seconds
Head, H <sub>2</sub> :	n/a	m

**Permeability Graph**



**Approvals**

Operator	A.M.	25/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



**ALLIED EXPLORATION & GEOTECHNICS LTD**

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC009      Depth (mBGL): 5.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Top of Section:	4.00	mBGL	Option	Criteria	
Base of Section:	6.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Diameter of Section:	92.00	mm	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Measurement Offset:	0.00	mAGL	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Standpipe Diameter:	19.00	mm	<input type="radio"/> D	Well point or hole extended in uniform soil	
Initial Water Level:	0.93	mBGL	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Weather Conditions:	Sunny		<input type="radio"/> F	Soil in casing with bottom in uniform soil	
			<input checked="" type="radio"/> G	Standpipe or Piezometer	

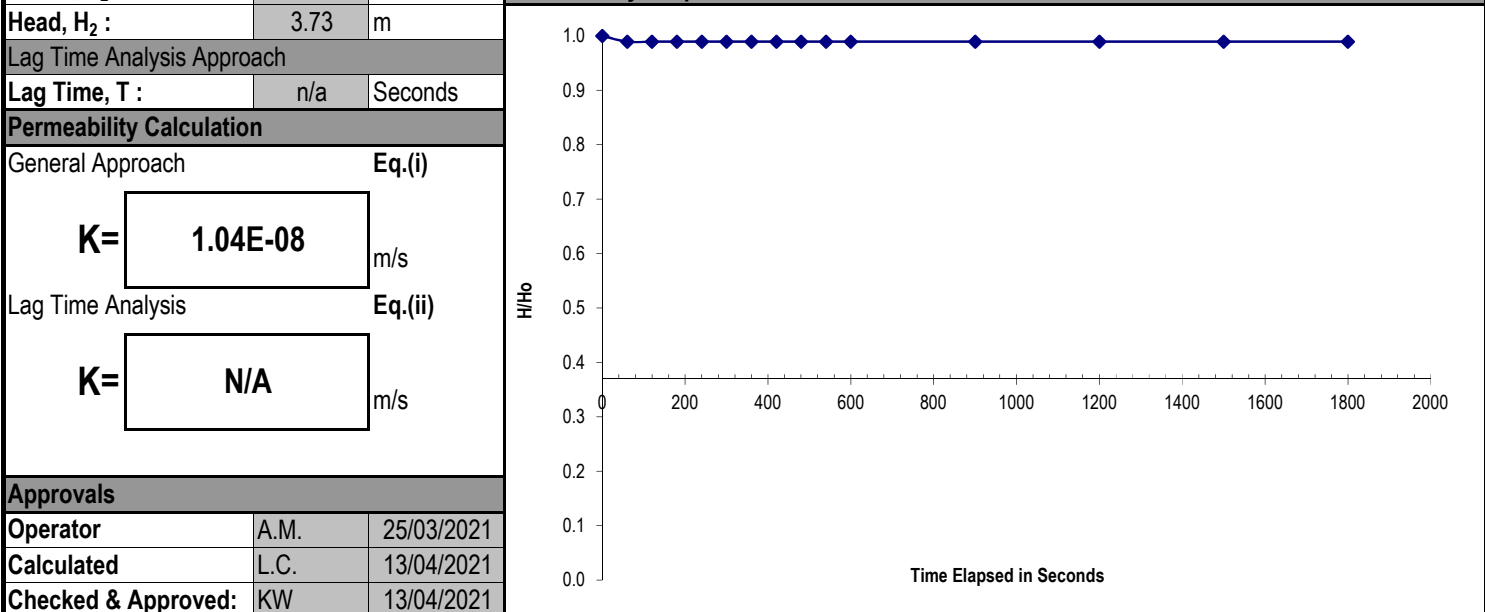
**Initial Response Zone Calculations      Readings**

Length, L:	2.00	m	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Diameter, D:	0.09	m	0	0	0	4.700	3.77	1.000	
L/D:	21.74	Ratio	1	0	60	4.660	3.73	0.989	
Response Area, A:	0.0066	m <sup>2</sup>	2	0	120	4.660	3.73	0.989	
Intake Factor, F:	3.7917	Coefficient	3	0	180	4.660	3.73	0.989	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			4	0	240	4.660	3.73	0.989	
<b>Permeability Equations</b>			5	0	300	4.660	3.73	0.989	
General Approach			6	0	360	4.660	3.73	0.989	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			7	0	420	4.660	3.73	0.989	
Lag Time Analysis			8	0	480	4.660	3.73	0.989	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			9	0	540	4.660	3.73	0.989	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			10	0	600	4.660	3.73	0.989	
			15	0	900	4.660	3.73	0.989	
			20	0	1200	4.660	3.73	0.989	
			25	0	1500	4.660	3.73	0.989	
			30	0	1800	4.660	3.73	0.989	

**Permeability Variable Determination**

General Approach		
Factor, T <sub>1</sub> :	0	Seconds
Head, H <sub>1</sub> :	3.77	m
Factor, T <sub>2</sub> :	1800	Seconds
Head, H <sub>2</sub> :	3.73	m

**Permeability Graph**



**Permeability Calculation**

General Approach      Eq.(i)		
<b>K =</b>	<b>1.04E-08</b>	m/s
Lag Time Analysis      Eq.(ii)		
<b>K =</b>	<b>N/A</b>	m/s

**Approvals**

Operator	A.M.	25/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD**

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Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC013      Depth (mBGL): 8.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	7.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	9.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	5.12	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast/Rain/ Strong Wind		<input checked="" type="radio"/> G	Standpipe or Piezometer	

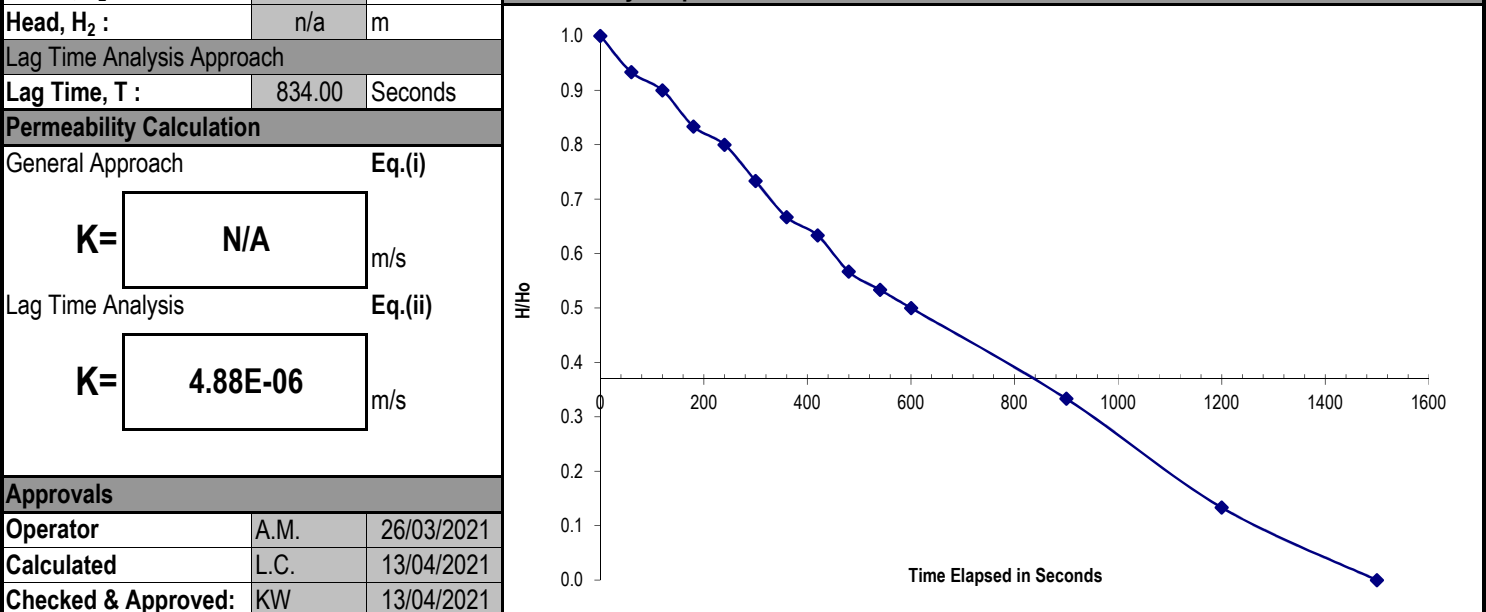
**Initial Response Zone Calculations      Readings**

Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	2.00	m	0	0	0	5.420	0.30	1.000	
Diameter, D:	0.15	m	1	0	60	5.400	0.28	0.933	
L/D:	13.33	Ratio	2	0	120	5.390	0.27	0.900	
Response Area, A:	0.0177	m <sup>2</sup>	3	0	180	5.370	0.25	0.833	
Intake Factor, F:	4.3430	Coefficient	4	0	240	5.360	0.24	0.800	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			5	0	300	5.340	0.22	0.733	
<b>Permeability Equations</b>			6	0	360	5.320	0.20	0.667	
General Approach			7	0	420	5.310	0.19	0.633	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			8	0	480	5.290	0.17	0.567	
Lag Time Analysis			9	0	540	5.280	0.16	0.533	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			10	0	600	5.270	0.15	0.500	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			15	0	900	5.220	0.10	0.333	
			20	0	1200	5.160	0.04	0.133	
			25	0	1500	5.120	0.00	0.000	

**Permeability Variable Determination**

General Approach		
Factor, T <sub>1</sub> :	n/a	Seconds
Head, H <sub>1</sub> :	n/a	m
Factor, T <sub>2</sub> :	n/a	Seconds
Head, H <sub>2</sub> :	n/a	m

**Permeability Graph**



Approvals		
Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



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Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**  
**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 2

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC016      Depth (mBGL): 5.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions. (2) Initial 60 seconds of test used to calculate 'K' using the General Approach.
Top of Section:	4.00	mBGL	Option	Criteria	
Base of Section:	6.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Diameter of Section:	150.00	mm	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Measurement Offset:	0.00	mAGL	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Standpipe Diameter:	19.00	mm	<input type="radio"/> D	Well point or hole extended in uniform soil	
Initial Water Level:	2.09	mBGL	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Weather Conditions:	Sunny		<input type="radio"/> F	Soil in casing with bottom in uniform soil	
			<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Length, L:	2.00	m	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Diameter, D:	0.15	m	0	0	0	4.800	2.71	1.000	
L/D:	13.33	Ratio	0	30	30	4.640	2.55	0.941	
Response Area, A:	0.0177	m <sup>2</sup>	1	0	60	4.520	2.43	0.897	
Intake Factor, F:	4.3430	Coefficient	2	0	120	4.520	2.43	0.897	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			3	0	180	4.520	2.43	0.897	
<b>Permeability Equations</b>			4	0	240	4.520	2.43	0.897	
General Approach			5	0	300	4.520	2.43	0.897	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			6	0	360	4.520	2.43	0.897	
Lag Time Analysis			7	0	420	4.520	2.43	0.897	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			8	0	480	4.520	2.43	0.897	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			9	0	540	4.520	2.43	0.897	
<b>Permeability Variable Determination</b>			10	0	600	4.520	2.43	0.897	
General Approach			15	0	900	4.520	2.43	0.897	
Factor, T <sub>1</sub> :	0	Seconds	20	0	1200	4.520	2.43	0.897	
Head, H <sub>1</sub> :	2.71	m	25	0	1500	4.520	2.43	0.897	
Factor, T <sub>2</sub> :	60	Seconds	30	0	1800	4.520	2.43	0.897	
Head, H <sub>2</sub> :	2.43	m							

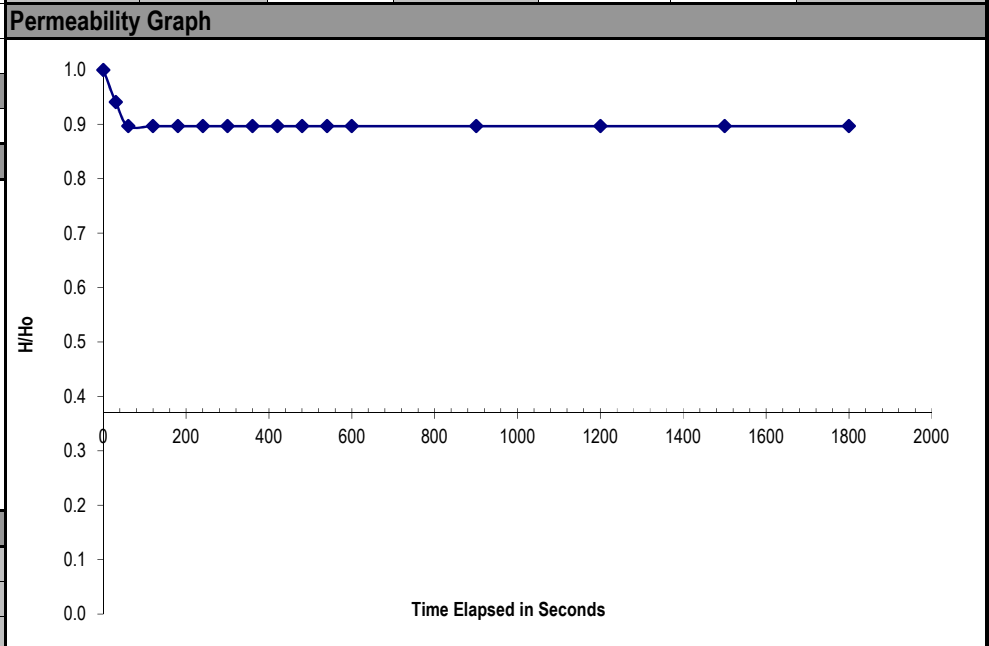
**Permeability Graph**

Lag Time Analysis Approach  
Lag Time, T : n/a      Seconds

**Permeability Calculation**

General Approach      Eq.(i)  
 $K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$   
**K = 7.40E-06**      m/s

Lag Time Analysis      Eq.(ii)  
 $K = \frac{A}{F \cdot T}$   
**K = N/A**      m/s



**Approvals**

Operator      A.M.      25/03/2021  
 Calculated      L.C.      13/04/2021  
 Checked & Approved:      KW      13/04/2021

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**VARIABLE HEAD PERMEABILITY TEST CALCULATION**  
**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Falling Head      Test No: 2 of 2

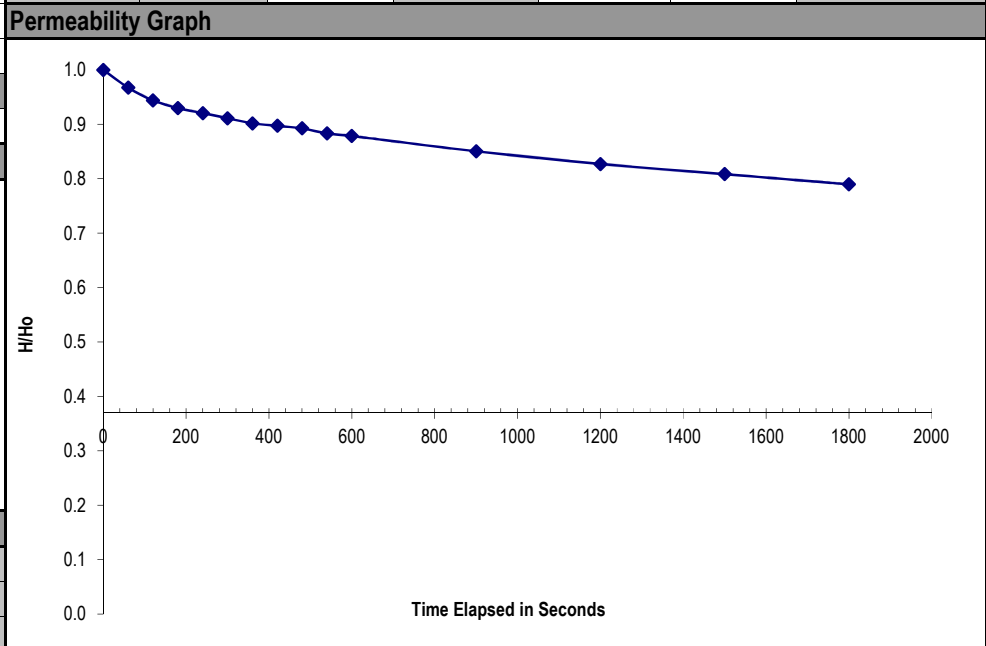
**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC016      Depth (mBGL): 5.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	4.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	6.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	2.14	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast/Light Showers		<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	2.00	m	0	0	0	0.000	2.14	1.000	
Diameter, D:	0.15	m	1	0	60	0.070	2.07	0.967	
L/D:	13.33	Ratio	2	0	120	0.120	2.02	0.944	
Response Area, A:	0.0177	m <sup>2</sup>	3	0	180	0.150	1.99	0.930	
Intake Factor, F:	4.3430	Coefficient	4	0	240	0.170	1.97	0.921	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			5	0	300	0.190	1.95	0.911	
<b>Permeability Equations</b>			6	0	360	0.210	1.93	0.902	
General Approach			7	0	420	0.220	1.92	0.897	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			8	0	480	0.230	1.91	0.893	
Lag Time Analysis			9	0	540	0.250	1.89	0.883	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			10	0	600	0.260	1.88	0.879	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			15	0	900	0.320	1.82	0.850	
			20	0	1200	0.370	1.77	0.827	
			25	0	1500	0.410	1.73	0.808	
			30	0	1800	0.450	1.69	0.790	
<b>Permeability Variable Determination</b>									
General Approach									
Factor, T <sub>1</sub> :	0	Seconds							
Head, H <sub>1</sub> :	2.14	m							
Factor, T <sub>2</sub> :	180	Seconds							
Head, H <sub>2</sub> :	1.99	m							

Permeability Graph		
Lag Time Analysis Approach		
Lag Time, T:	n/a	Seconds
<b>Permeability Calculation</b>		
General Approach      Eq.(i)		
K =	<b>1.64E-06</b>	m/s
Lag Time Analysis      Eq.(ii)		
K =	<b>N/A</b>	m/s
<b>Approvals</b>		
Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021





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**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

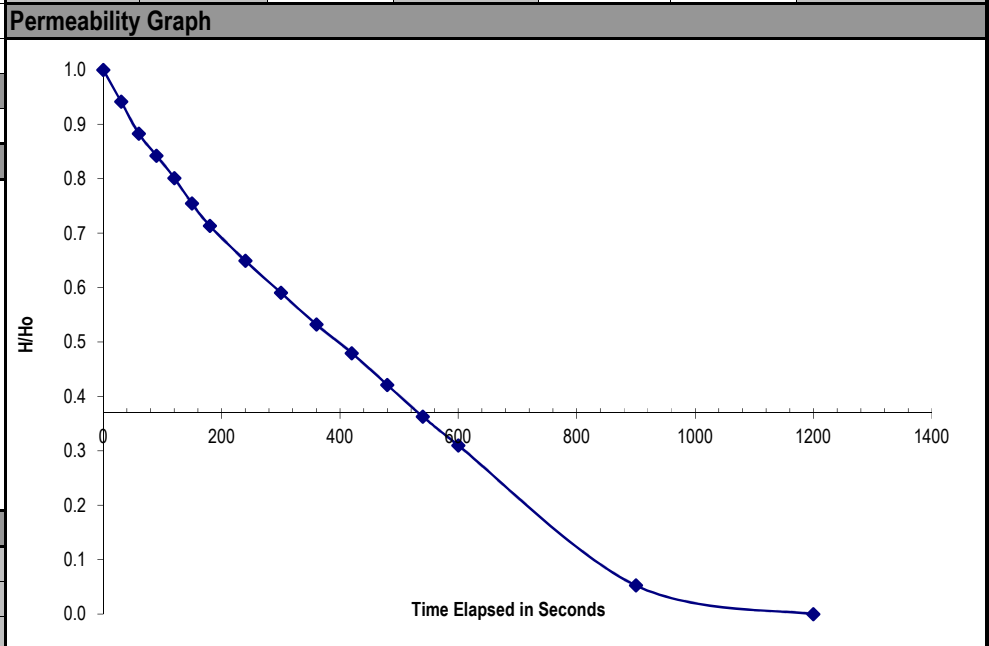
**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC018      Depth (mBGL): 2.50

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	2.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	3.50	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	0.54	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast/Rain/ Strong Wind		<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	1.50	m	0	0	0	2.250	1.71	1.000	
Diameter, D:	0.15	m	0	0	0	2.150	1.61	0.942	
L/D:	10.00	Ratio	0	30	30	2.050	1.51	0.883	
Response Area, A:	0.0177	m <sup>2</sup>	1	0	60	2.050	1.51	0.883	
Intake Factor, F:	3.5615	Coefficient	1	30	90	1.980	1.44	0.842	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			2	0	120	1.910	1.37	0.801	
Permeability Equations			2	30	150	1.830	1.29	0.754	
General Approach			3	0	180	1.760	1.22	0.713	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			4	0	240	1.650	1.11	0.649	
Lag Time Analysis			5	0	300	1.550	1.01	0.591	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			6	0	360	1.450	0.91	0.532	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			7	0	420	1.360	0.82	0.480	
Permeability Variable Determination			8	0	480	1.260	0.72	0.421	
General Approach			9	0	540	1.160	0.62	0.363	
Factor, T <sub>1</sub> :	n/a	Seconds	10	0	600	1.070	0.53	0.310	
Head, H <sub>1</sub> :	n/a	m	15	0	900	0.630	0.09	0.053	
Factor, T <sub>2</sub> :	n/a	Seconds	20	0	1200	0.540	0.00	0.000	
Head, H <sub>2</sub> :	n/a	m							

Permeability Graph		
Lag Time Analysis Approach		
Lag Time, T :	532.38	Seconds
Permeability Calculation		
General Approach Eq.(i)		
K =	N/A	m/s
Lag Time Analysis Eq.(ii)		
K =	9.32E-06	m/s
Approvals		
Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



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Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC020      Depth (mBGL): 5.50

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	5.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	6.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	1.14	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Cloudy/Sunny		<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	1.00	m	0	0	0	4.160	3.02	1.000	
Diameter, D:	0.15	m	1	0	60	3.980	2.84	0.940	
L/D:	6.67	Ratio	2	0	120	3.830	2.69	0.891	
Response Area, A:	0.0177	m <sup>2</sup>	3	0	180	3.700	2.56	0.848	
Intake Factor, F:	2.7329	Coefficient	4	0	240	3.640	2.50	0.828	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			5	0	300	3.580	2.44	0.808	
<b>Permeability Equations</b>			6	0	360	3.520	2.38	0.788	
General Approach			7	0	420	3.470	2.33	0.772	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			8	0	480	3.410	2.27	0.752	
Lag Time Analysis			9	0	540	3.360	2.22	0.735	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			10	0	600	3.310	2.17	0.719	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			15	0	900	3.070	1.93	0.639	
<b>Permeability Variable Determination</b>			20	0	1200	2.850	1.71	0.566	
General Approach			25	0	1500	2.650	1.51	0.500	
Factor, T <sub>1</sub> :	n/a	Seconds	30	0	1800	2.440	1.30	0.430	
Head, H <sub>1</sub> :	n/a	m	40	0	2400	2.250	1.11	0.368	
Factor, T <sub>2</sub> :	n/a	Seconds	50	0	3000	2.060	0.92	0.305	
Head, H <sub>2</sub> :	n/a	m	60	0	3600	1.880	0.74	0.245	

Lag Time Analysis Approach

Lag Time, T : 2376.63 Seconds

**Permeability Calculation**

General Approach      Eq.(i)

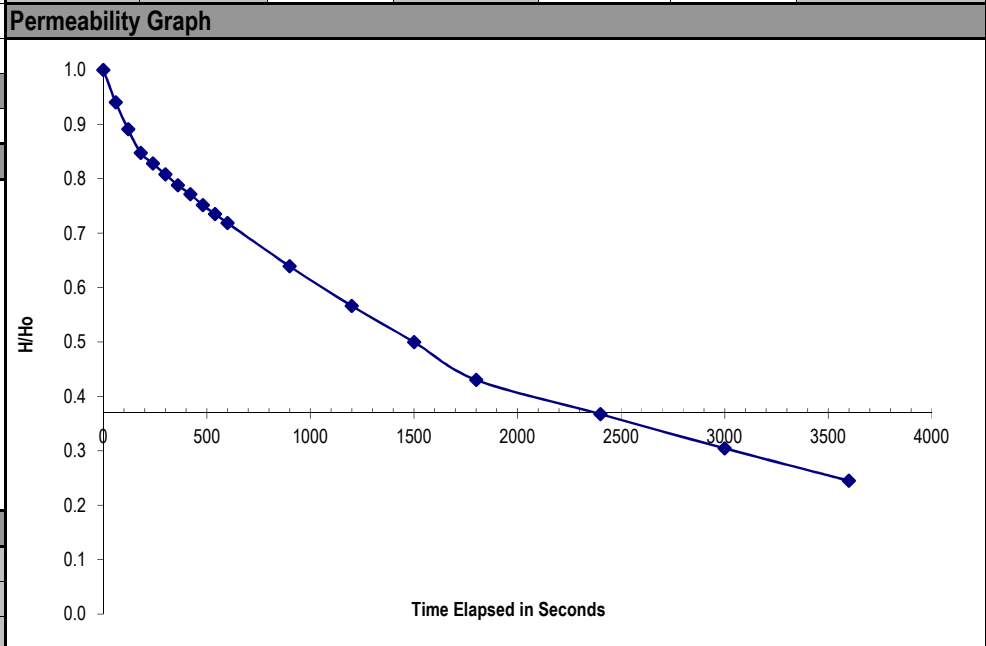
**K = N/A**      m/s

Lag Time Analysis      Eq.(ii)

**K = 2.72E-06**      m/s

**Approvals**

Operator: A.M.      26/03/2021  
Calculated: L.C.      13/04/2021  
Checked & Approved: KW      13/04/2021





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**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

**Installation Type :** 19mm Standpipe Piezometer      **Method:** Falling Head      **Test No:** 1 of 1

**Contract & Position Details**

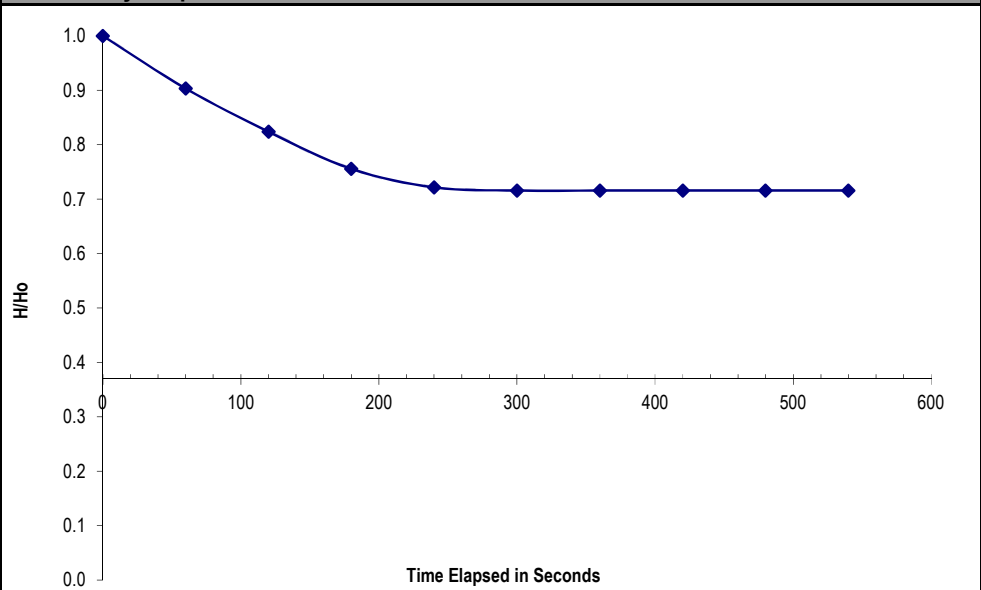
**Site:** A66 North Trans Pennine Scheme C Section 9  
**Contract :** 4322A      **Exploratory Hole:** BH SBC021      **Depth (mBGL):** 2.50

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	2.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	3.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	0.57	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Cloudy/Sunny		<input checked="" type="radio"/> G	Standpipe or Piezometer	

**Initial Response Zone Calculations**      **Readings**

Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	1.00	m				2.330	1.76	1.000	
Diameter, D:	0.15	m	0	0	0	2.160	1.59	0.903	
L/D:	6.67	Ratio	1	0	60	2.020	1.45	0.824	
Response Area, A:	0.0177	m <sup>2</sup>	2	0	120	1.900	1.33	0.756	
Intake Factor, F:	2.7329	Coefficient	3	0	180	1.840	1.27	0.722	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			4	0	240	1.830	1.26	0.716	
<b>Permeability Equations</b>			5	0	300	1.830	1.26	0.716	
General Approach			6	0	360	1.830	1.26	0.716	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ <b>Eq.(i)</b>			7	0	420	1.830	1.26	0.716	
Lag Time Analysis			8	0	480	1.830	1.26	0.716	
$K = \frac{A}{F \cdot T}$ <b>Eq.(ii)</b>			9	0	540	1.830	1.26	0.716	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37									
<b>Permeability Variable Determination</b>									
General Approach									
Factor, T <sub>1</sub> :	0	Seconds							
Head, H <sub>1</sub> :	1.76	m							
Factor, T <sub>2</sub> :	180	Seconds							
Head, H <sub>2</sub> :	1.33	m							

**Permeability Graph**



**Permeability Calculation**

General Approach      **Eq.(i)**  
**K = 1.01E-05** m/s

Lag Time Analysis      **Eq.(ii)**  
**K = N/A** m/s

**Approvals**

**Operator** A.M.      26/03/2021  
**Calculated** L.C.      13/04/2021  
**Checked & Approved:** KW      13/04/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD**

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**  
**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC022      Depth (mBGL): 1.50

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	1.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	2.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	0.50	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Cloudy/Sunny		<input checked="" type="radio"/> G	Standpipe or Piezometer	

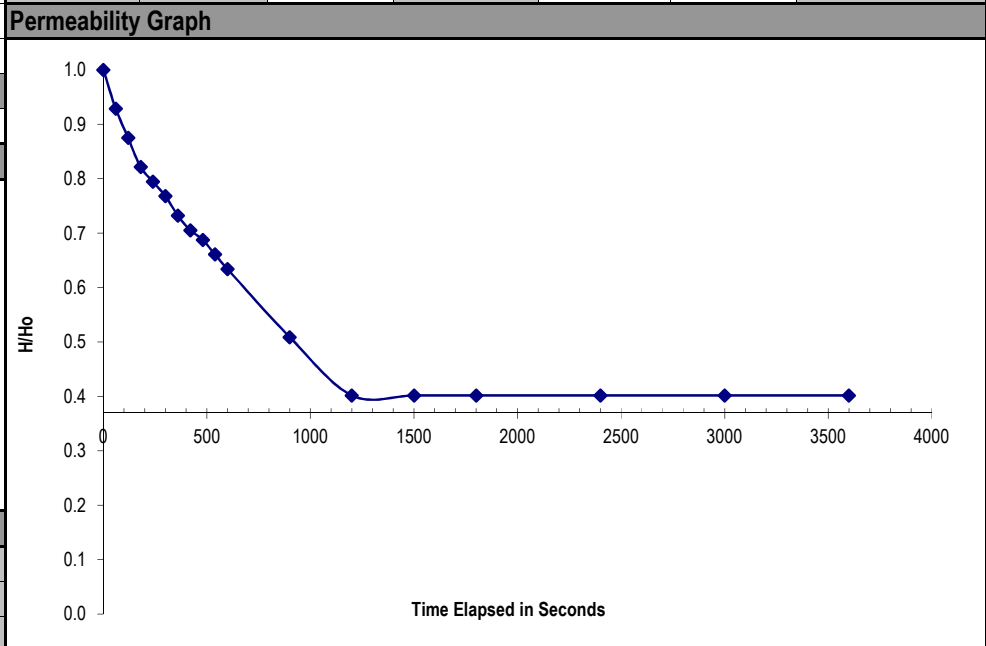
Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	1.00	m	0	0	0	1.620	1.12	1.000	
Diameter, D:	0.15	m	1	0	60	1.540	1.04	0.929	
L/D:	6.67	Ratio	2	0	120	1.480	0.98	0.875	
Response Area, A:	0.0177	m <sup>2</sup>	3	0	180	1.420	0.92	0.821	
Intake Factor, F:	2.7329	Coefficient	4	0	240	1.390	0.89	0.795	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			5	0	300	1.360	0.86	0.768	
<b>Permeability Equations</b>			6	0	360	1.320	0.82	0.732	
General Approach			7	0	420	1.290	0.79	0.705	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			8	0	480	1.270	0.77	0.688	
Lag Time Analysis			9	0	540	1.240	0.74	0.661	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			10	0	600	1.210	0.71	0.634	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			15	0	900	1.070	0.57	0.509	
<b>Permeability Variable Determination</b>			20	0	1200	0.950	0.45	0.402	
General Approach			25	0	1500	0.950	0.45	0.402	
Factor, T <sub>1</sub> :	0	Seconds	30	0	1800	0.950	0.45	0.402	
Head, H <sub>1</sub> :	1.12	m	40	0	2400	0.950	0.45	0.402	
Factor, T <sub>2</sub> :	240	Seconds	50	0	3000	0.950	0.45	0.402	
Head, H <sub>2</sub> :	0.89	m	60	0	3600	0.950	0.45	0.402	

Lag Time Analysis Approach  
Lag Time, T : n/a      Seconds

**Permeability Calculation**

General Approach      Eq.(i)  
**K = 6.19E-06**      m/s

Lag Time Analysis      Eq.(ii)  
**K = N/A**      m/s



**Approvals**

Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021



**ALLIED EXPLORATION & GEOTECHNICS LTD**

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC023A      Depth (mBGL): 8.50

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Top of Section:	7.50	mBGL	Option	Criteria	
Base of Section:	9.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Diameter of Section:	150.00	mm	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Measurement Offset:	0.00	mAGL	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Standpipe Diameter:	19.00	mm	<input type="radio"/> D	Well point or hole extended in uniform soil	
Initial Water Level:	5.38	mBGL	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Weather Conditions:	Sunny/Strong Wind		<input type="radio"/> F	Soil in casing with bottom in uniform soil	
			<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Length, L:	1.50	m	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Diameter, D:	0.15	m	0	0	0	8.290	2.91	1.000	
L/D:	10.00	Ratio	1	0	60	8.260	2.88	0.990	
Response Area, A:	0.0177	m <sup>2</sup>	2	0	120	8.260	2.88	0.990	
Intake Factor, F:	3.5615	Coefficient	3	0	180	8.260	2.88	0.990	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			4	0	240	8.260	2.88	0.990	
<b>Permeability Equations</b>			5	0	300	8.260	2.88	0.990	
General Approach			6	0	360	8.260	2.88	0.990	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			7	0	420	8.260	2.88	0.990	
Lag Time Analysis			8	0	480	8.260	2.88	0.990	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			9	0	540	8.260	2.88	0.990	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			10	0	600	8.260	2.88	0.990	
			15	0	900	8.260	2.88	0.990	
			20	0	1200	8.260	2.88	0.990	
			25	0	1500	8.260	2.88	0.990	
			30	0	1800	8.260	2.88	0.990	

Permeability Variable Determination			Permeability Graph						
General Approach									
Factor, T <sub>1</sub> :	0	Seconds							
Head, H <sub>1</sub> :	2.91	m							
Factor, T <sub>2</sub> :	1800	Seconds							
Head, H <sub>2</sub> :	2.88	m							

Lag Time Analysis Approach		
Lag Time, T:	n/a	Seconds

Permeability Calculation		
General Approach      Eq.(i)		
K=	<b>2.86E-08</b>	m/s
Lag Time Analysis      Eq.(ii)		
K=	<b>N/A</b>	m/s

Approvals		
Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD**

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
Regional Office: Suite 20 Business Development Centre, Eanam Wharf, Eanam Old Road, Blackburn, BB1 5BL

**VARIABLE HEAD PERMEABILITY TEST CALCULATION**

**BS5930: 1999 (Amendment 1): Section 4: Clause 25.4**

Installation Type : 19mm Standpipe Piezometer      Method: Rising Head      Test No: 1 of 1

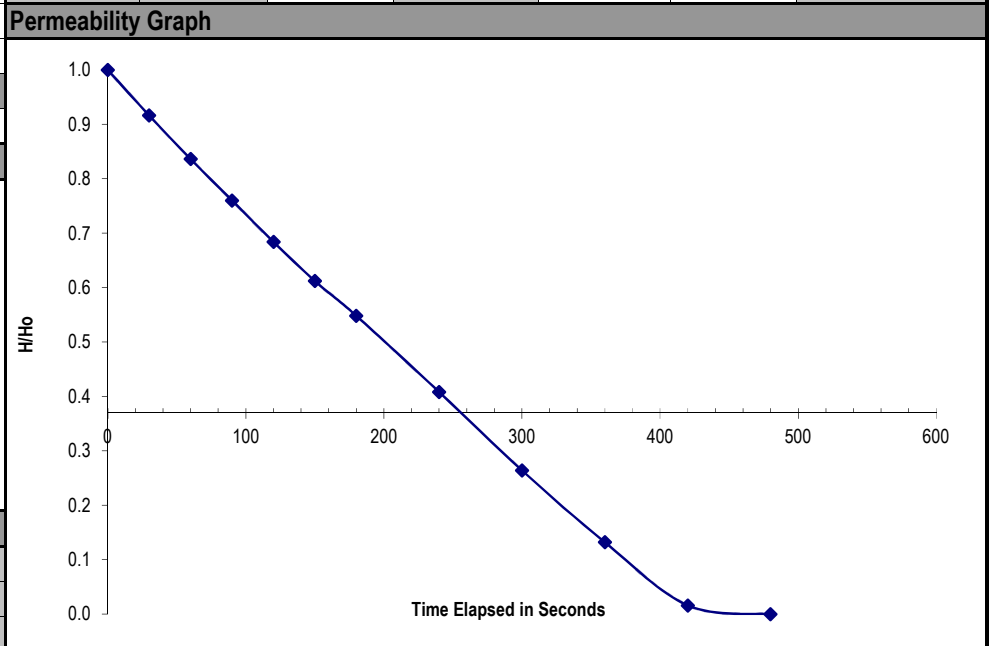
**Contract & Position Details**

Site: A66 North Trans Pennine Scheme C Section 9  
Contract : 4322A      Exploratory Hole: BH SBC030      Depth (mBGL): 3.00

Initial Conditions			Intake Factor Selection		Comments (1) Refer to Exploratory Hole Record for soil conditions.
Parameter	Value	Unit	Option	Criteria	
Top of Section:	2.00	mBGL	<input type="radio"/> A	Soil flush with bottom at impervious boundary	
Base of Section:	4.00	mBGL	<input type="radio"/> B	Soil flush with bottom in uniform soil	
Diameter of Section:	150.00	mm	<input type="radio"/> C	Well point or hole extended at impervious boundary	
Measurement Offset:	0.00	mAGL	<input type="radio"/> D	Well point or hole extended in uniform soil	
Standpipe Diameter:	19.00	mm	<input type="radio"/> E	Soil in casing with bottom at impervious boundary	
Initial Water Level:	0.35	mBGL	<input type="radio"/> F	Soil in casing with bottom in uniform soil	
Weather Conditions:	Overcast/Sunny		<input checked="" type="radio"/> G	Standpipe or Piezometer	

Initial Response Zone Calculations			Readings						
Parameter	Value	Unit	Minutes	Seconds	Total Seconds	Water Level Depth (m)	Head (m)	H/H <sub>0</sub>	Notes
Length, L:	2.00	m	0	0	0	2.850	2.50	1.000	
Diameter, D:	0.15	m	0	30	30	2.640	2.29	0.916	
L/D:	13.33	Ratio	1	0	60	2.440	2.09	0.836	
Response Area, A:	0.0177	m <sup>2</sup>	1	30	90	2.250	1.90	0.760	
Intake Factor, F:	4.3430	Coefficient	2	0	120	2.060	1.71	0.684	
<i>using</i> $2.32\pi L / \ln\{1.1(L/D)\} + \sqrt{1 + 1.1(L/D)^2}$			2	30	150	1.880	1.53	0.612	
<b>Permeability Equations</b>			3	0	180	1.720	1.37	0.548	
General Approach			4	0	240	1.370	1.02	0.408	
$K = \frac{A}{F \cdot (T_2 - T_1)} \cdot \ln(H_1/H_2)$ Eq.(i)			5	0	300	1.010	0.66	0.264	
Lag Time Analysis			6	0	360	0.680	0.33	0.132	
$K = \frac{A}{F \cdot T}$ Eq.(ii)			7	0	420	0.390	0.04	0.016	
Eq.(ii) where T is the Basic Time Lag Factor coinciding with a H/H <sub>0</sub> of 0.37			8	0	480	0.350	0.00	0.000	
<b>Permeability Variable Determination</b>									
General Approach									
Factor, T <sub>1</sub> :	n/a	Seconds							
Head, H <sub>1</sub> :	n/a	m							
Factor, T <sub>2</sub> :	n/a	Seconds							
Head, H <sub>2</sub> :	n/a	m							

Permeability Graph		
Lag Time Analysis Approach		
Lag Time, T :	255.83	Seconds
<b>Permeability Calculation</b>		
General Approach      Eq.(i)		
K =	N/A	m/s
Lag Time Analysis      Eq.(ii)		
K =	1.59E-05	m/s
<b>Approvals</b>		
Operator	A.M.	26/03/2021
Calculated	L.C.	13/04/2021
Checked & Approved:	KW	13/04/2021







*In-situ* Water Quality Parameter Test Results





# ALLIED EXPLORATION GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2...  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## IN-SITU WATER QUALITY PARAMETER MONITORING RESULTS

**Date of Test:** 29/03/2021      **Operator:** A.M.

**Weather Condition (inc temperature):** Windy (13°C)

Monitoring Point	Time	pH	Temp (°C)	Electrical Conductivity (µS)	Redox Potential (mv)	Dissolved Oxygen (mg/L)
BH SBC006	12:08:00	7.95	12.31	752.37	-586.5	1.57
	12:11:00	7.90	12.61	758.40	-407.3	1.55
	12:14:00	7.88	12.89	763.68	-337.3	1.48
BH SBC008	11:24:00	8.21	12.68	1296.80	-335.0	0.69
	11:27:00	8.25	11.91	1268.90	-272.1	0.52
	11:30:00	8.22	11.98	1282.60	-460.1	0.56
BH SBC032A	13:54:00	9.44	12.35	678.57	-251.30	5.90
	13:57:00	9.43	12.51	679.36	-113.40	5.91
	14:00:00	9.42	12.71	681.47	-140.00	5.90

**Remarks :**

**Contract Title:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited



**Checked By:** [Redacted]

**Approved By:** [Redacted]



**Date of issue:** 06/04/2021      **Page No. :** 1

**AEG Contract No. :** 4322A

## Photo-ionisation Detector Test Results





# ALLIED EXPLORATION & GEOTECHNICS LIMITED



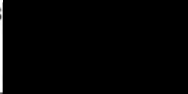
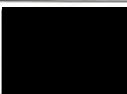
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PHOTO-IONISATION DETECTOR

Exploratory Hole No.	Depth (m)	PID (ppm)	Date Tested	Remarks
BH SBC001	0.20	See Remarks	08/03/2021	<0.1 ppm
BH SBC001	0.50	See Remarks	08/03/2021	<0.1 ppm
BH SBC001	1.00	See Remarks	08/03/2021	<0.1 ppm
BH SBC007	0.20	See Remarks	02/03/2021	<0.1 ppm
BH SBC007	1.00	See Remarks	02/03/2021	<0.1 ppm
BH SBC007	1.70	See Remarks	02/03/2021	<0.1 ppm
BH SBC007	2.50	See Remarks	02/03/2021	<0.1 ppm
BH SBC007	3.00	See Remarks	02/03/2021	<0.1 ppm
TP SBC001	0.20	See Remarks	02/03/2021	<0.1 ppm
TP SBC001	1.00	See Remarks	02/03/2021	<0.1 ppm
TP SBC001	2.10	See Remarks	02/03/2021	<0.1 ppm
TP SBC002	0.20	See Remarks	26/02/2021	<0.1 ppm
TP SBC002	1.00	See Remarks	26/02/2021	<0.1 ppm
TP SBC002	2.50	See Remarks	26/02/2021	<0.1 ppm

See attached Calibration Certificate for Model No. and any other details

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Calibration Compliant :- YES	Date of Issue :- 26/08/2021	Page No. :- 1 of 1	
	Checked By 	Approved By 	AEG Contract No. :- 4322A	



*...everything gas detection*

## Certificate of Calibration

Customer: Allied Exploration & Geotechnics Ltd

Instrument: MiniRAE 2000

Job: Service, Test & Calibration

Serial number: 110-900192

Fleet Number: N/A

Certificate no: 900192/140720

Next calibration due date: 14 July 2021

Tested on: 14 July 2020


Calibrated for: Isobutylene

<u>Applied Gas Concentration:</u>	<u>Cylinder Reference:</u>	<u>Initial Sensor Reading</u>	<u>Final Sensor Reading</u>	<u>Accuracy Limits</u>
Isobutylene: 100 ppm	AG3607-3-2	94.0 ppm	100.0 ppm	± 2%

The Instrument has been calibrated after Re-Zeroing & Introducing Span Calibration Gas, using gas that is traceable to national standards and has been prepared in accordance with BS EN ISO6145-6:2008

Calibration Engineer: P Lonsdale

Sign: 

Quality Assessed by (Print):	C.S.	Sign:	
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**Determination of the Soil Infiltration Rate for Soakaway Design  
Test Results**

**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SBC001      DEPTH: 2.00      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.19	mBGL
Operator:	M. Bell	
Test Date:	02/03/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.798	m
Soakaway 75% Full:	1.393	m
Soakaway 50% Full:	1.595	m
Test No.:	1 of 3	
Weather Conditions:	Foggy	
Test Zone (m):	1.19	to 2.00

**TEST CALCULATION**

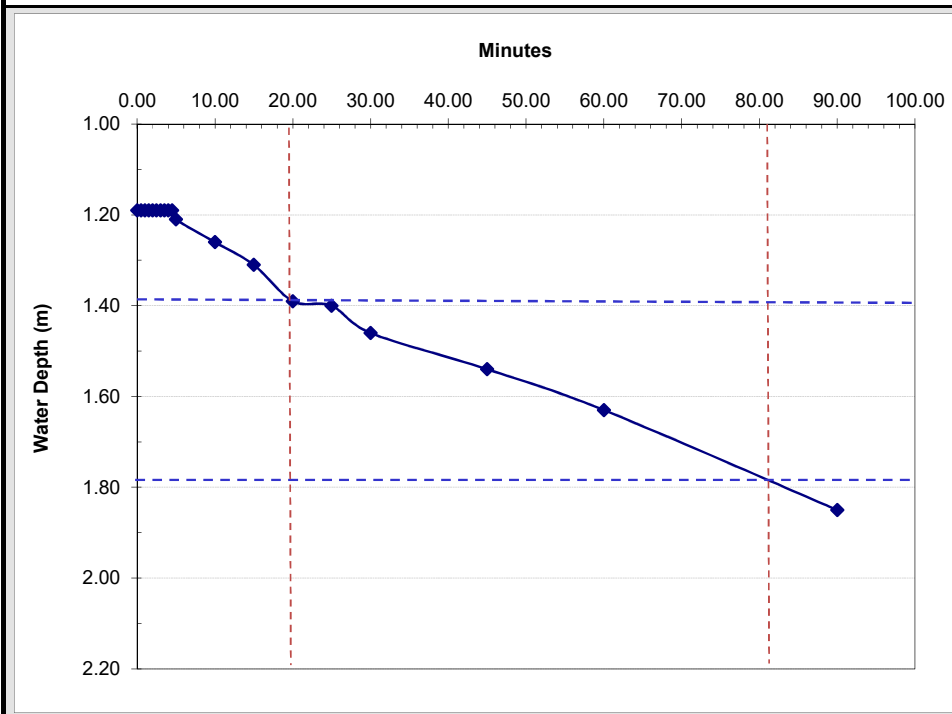
**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.  
 $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area  
 $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.19	Test Start
0.50	1.19	
1.00	1.19	
1.50	1.19	
2.00	1.19	
2.50	1.19	
3.00	1.19	
3.50	1.19	
4.00	1.19	
4.50	1.19	
5.00	1.21	
10.00	1.26	
15.00	1.31	
20.00	1.39	
25.00	1.40	
30.00	1.46	
45.00	1.54	
60.00	1.63	
90.00	1.85	

Test Finish



Time (from Graph) 75% Full: 20.0 Minutes  
 Time (from Graph) 25% Full: 82.0 Minutes

$$t_{p75-25} = 62.0 \text{ Minutes}$$

**MATERIAL TYPE**

0.35-2.20m: Soft orangish brown very sandy very gravelly CLAY with medium cobble content.

**REMARKS**

(1) Infiltration rate (f) calculated. (2) Average infiltration rate (f) calculated from all three soakaway test procedures. (See sheet 3 of 3 for average infiltration rate). (3) Soakaway terminated at 90 minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25} = 0.810 \text{ m}^3$   
 $a_{p50} = 4.430 \text{ m}^2$   
**Soil Infiltration Rate (f) = 4.92E-05 m/s From (i)**

Calculated: K.W      Date: 16/03/2021



**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

**SITE:** A66 North Trans Pennine Scheme C Section 9

**CONTRACT:** 4322A      **PIT:** TP SBC001 **DEPTH:** 2.00      **mBGL**

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.10	mBGL
Operator:	<b>M .Bell</b>	
Test Date:	02/03/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.775	m
Soakaway 75% Full:	1.325	m
Soakaway 50% Full:	1.550	m
Test No.:	<b>2 of 3</b>	
Weather Conditions:	Foggy	
Test Zone (m):	1.10	to 2.00

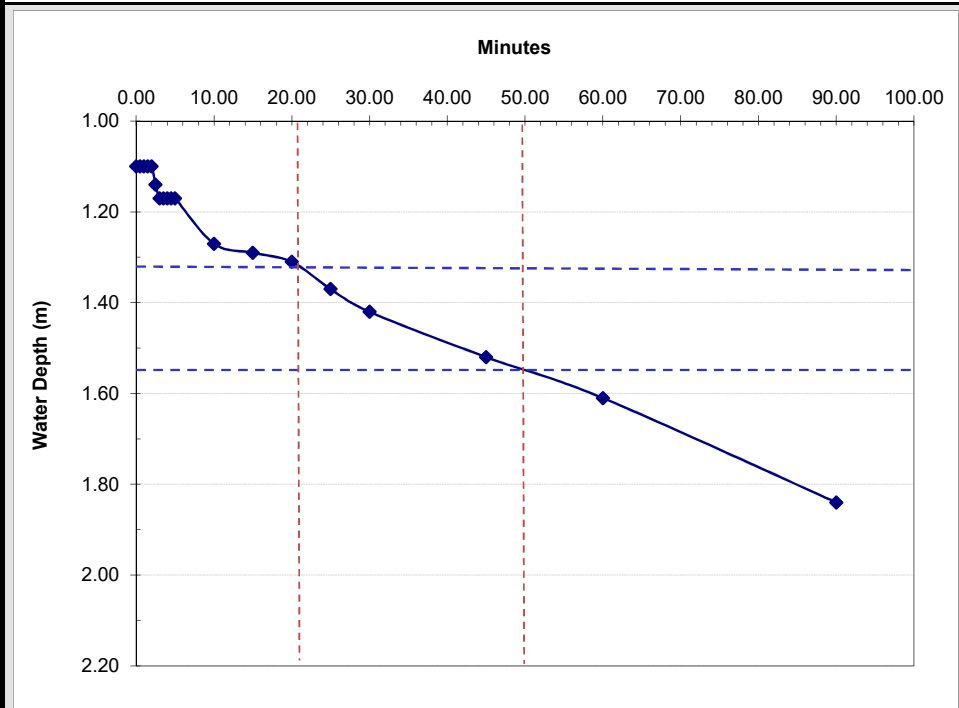
**TEST CALCULATION**

**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.  
 $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area  
 $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.10	Test Start
0.50	1.10	
1.00	1.10	
1.50	1.10	
2.00	1.10	
2.50	1.14	
3.00	1.17	
3.50	1.17	
4.00	1.17	
4.50	1.17	
5.00	1.17	
10.00	1.27	
15.00	1.29	
20.00	1.31	
25.00	1.37	
30.00	1.42	
45.00	1.52	
60.00	1.61	
90.00	1.84	Test Finish



**Time (from Graph) 75% Full:** 21.0 Minutes  
**Time (from Graph) 25% Full:** 50.0 Minutes

$t_{p75-25} = 29.0$  Minutes

**MATERIAL TYPE**  
 0.35-2.20m: Soft orangish brown very sandy very gravelly CLAY with medium cobble content.

**REMARKS**

(1) Infiltration rate (f) calculated. (2) Average infiltration rate (f) calculated from all three soakaway test procedures. (See sheet 3 of 3 for average infiltration rate). (3) Soakaway terminated at 90 minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25} = 0.900$  m<sup>3</sup>  
 $a_{p50} = 4.700$  m<sup>2</sup>  
**Soil Infiltration Rate (f) = 1.10E-04** m/s      **From (i)**

**Calculated:** K.W      **Date:** 16/03/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SBC001      DEPTH: 2.00      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.11	mBGL
Operator:	M. Bell	
Test Date:	02/03/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.778	m
Soakaway 75% Full:	1.333	m
Soakaway 50% Full:	1.555	m
Test No.:	3 of 3	
Weather Conditions:	Cloudy	
Test Zone (m):	1.11	to 2.00

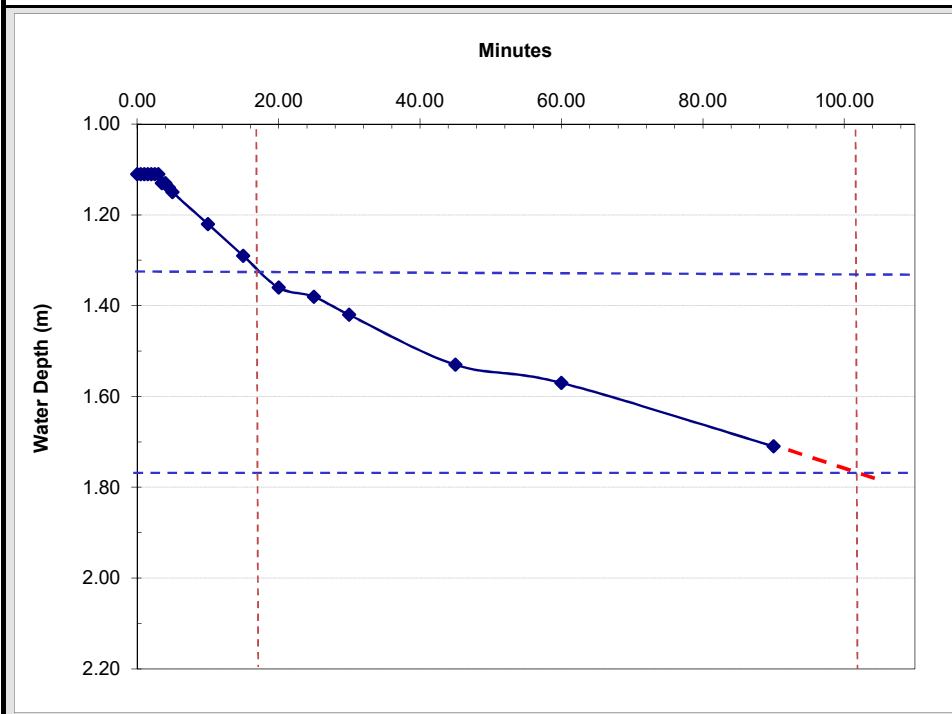
**TEST CALCULATION**

**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.  
 $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area  
 $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.11	Test Start
0.50	1.11	
1.00	1.11	
1.50	1.11	
2.00	1.11	
2.50	1.11	
3.00	1.11	
3.50	1.13	
4.00	1.13	
4.50	1.14	
5.00	1.15	
10.00	1.22	
15.00	1.29	
20.00	1.36	
25.00	1.38	
30.00	1.42	
45.00	1.53	
60.00	1.57	
90.00	1.71	Test Finish



Time (from Graph) 75% Full:	18.0	Minutes
Time (from Graph) 25% Full:	105.0	Minutes
$t_{p75-25} =$		<b>87.0</b> Minutes

**MATERIAL TYPE**  
 0.35-2.20m: Soft orangish brown very sandy very gravelly CLAY with medium cobble content.

**REMARKS**

(1) Water level did not reach 25% effective depth level during test - 25% full time extrapolated from graph for the purposes of the calculation (2) Average infiltration rate (f) calculated from all three soakaway test procedures. (3) Soakaway terminated at 90 minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25}$	=	0.890	$m^3$
$a_{p50}$	=	4.670	$m^2$
<b>Soil Infiltration Rate (f) =</b>		<b>3.65E-05</b>	<b>m/s</b> <b>From (i)</b>
<b>Ave. Soil Infiltration Rate (f) =</b>		<b>6.52E-05</b>	<b>m/s</b>

Calculated: K.W      Date: 16/03/2021



**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SCB008      DEPTH: 2.00      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.30	mBGL
Operator:	M. Bell	
Test Date:	23/02/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.825	m
Soakaway 75% Full:	1.475	m
Soakaway 50% Full:	1.650	m
Test No.:	1 of 1	
Weather Conditions:	Light showers	
Test Zone (m):	1.30	to 2.00

**TEST CALCULATION**

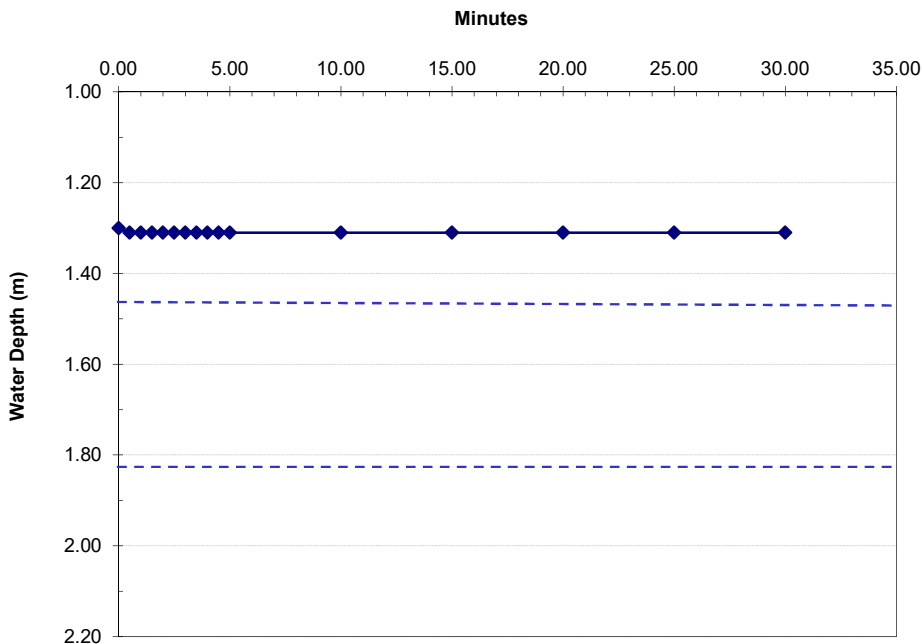
**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.

$a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area

$t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.



Minutes	Water Depth (m)	Remarks
0.00	1.30	Test Start
0.50	1.31	
1.00	1.31	
1.50	1.31	
2.00	1.31	
2.50	1.31	
3.00	1.31	
3.50	1.31	
4.00	1.31	
4.50	1.31	
5.00	1.31	
10.00	1.31	
15.00	1.31	
20.00	1.31	
25.00	1.31	
30.00	1.31	Test Finish

Time (from Graph) 75% Full: n/a Minutes  
Time (from Graph) 25% Full: n/a Minutes

$t_{p75-25} =$	n/a	Minutes
----------------	-----	---------

**MATERIAL TYPE**  
0.10-1.50m: Soft mottled grey orangish brown sandy slightly gravelly CLAY. 1.50-2.20m: Soft mottled orangish blueish brown very sandy gravelly CLAY with low cobble content.

**REMARKS**  
(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (f) calculated. (2) After 45 minutes - large collapse of Faces A and C. Water level between 45 and 60 minutes: 1.18m BGL. (3) Soakaway calculation terminated at 30 minutes

**SOIL INFILTRATION RESULTS**

$V_{p75-25}$	=	0.700	m <sup>3</sup>
$a_{p50}$	=	4.100	m <sup>2</sup>
Soil Infiltration Rate (f)	=	n/a	m/s

From (i)

Calculated: K.W      Date: 16/03/2021

**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SCB018      DEPTH: 4.50      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.31	mBGL
Operator:	M. Bell	
Test Date:	23/02/2021	

**EFFECTIVE DEPTH DETAILS**

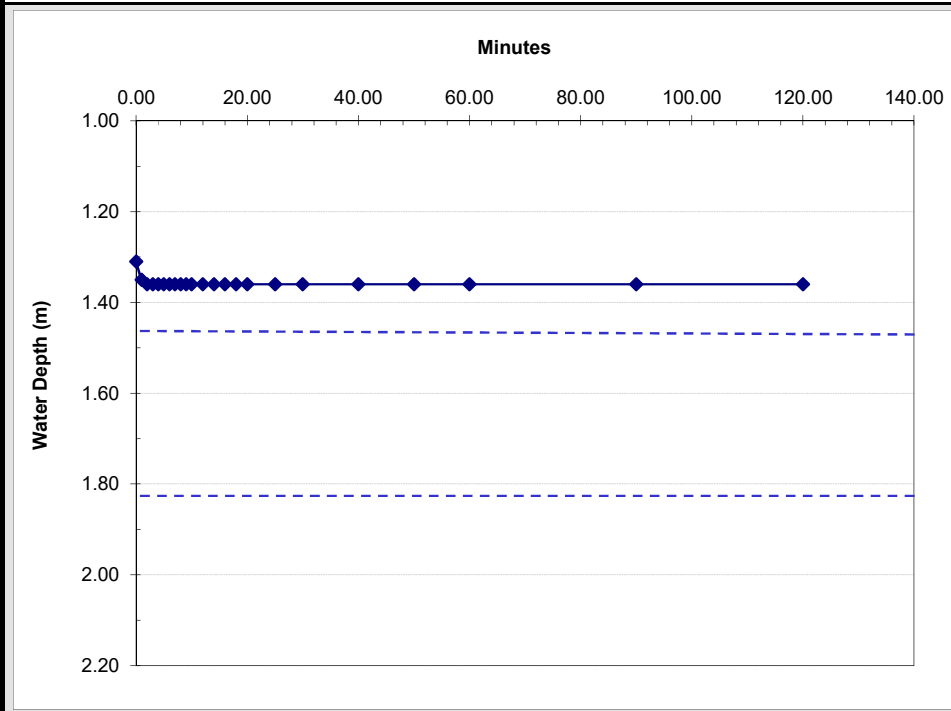
Soakaway 25% Full:	1.828	m
Soakaway 75% Full:	1.483	m
Soakaway 50% Full:	1.655	m
Test No.:	1 of 1	
Weather Conditions:	Light showers	
Test Zone (m):	1.31	to 2.00

**TEST CALCULATION**

**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- $V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area
- $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.



Minutes	Water Depth (m)	Remarks
0.00	1.31	Test Start
1.00	1.35	
2.00	1.36	
3.00	1.36	
4.00	1.36	
5.00	1.36	
6.00	1.36	
7.00	1.36	
8.00	1.36	
9.00	1.36	
10.00	1.36	
12.00	1.36	
14.00	1.36	
16.00	1.36	
18.00	1.36	
20.00	1.36	
25.00	1.36	
30.00	1.36	
40.00	1.36	
50.00	1.36	
60.00	1.36	
90.00	1.36	
120.00	1.36	Test Finish

Time (from Graph) 75% Full:	n/a	Minutes
Time (from Graph) 25% Full:	n/a	Minutes
$t_{p75-25} =$	n/a	Minutes

**MATERIAL TYPE**  
0.80-2.60m: Firm brown and grey mottled slightly sandy slightly CLAY with medium cobble content.

**REMARKS**  
(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (f) calculated. (2) Soakaway terminated at 120 minutes

**SOIL INFILTRATION RESULTS**

$V_{p75-25}$	=	0.690	m <sup>3</sup>
$a_{p50}$	=	4.070	m <sup>2</sup>
Soil Infiltration Rate (f)	=	n/a	m/s      From (i)

Calculated: K.W      Date: 16/03/2021



**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

**SITE:** A66 North Trans Pennine Scheme C Section 9

**CONTRACT:** 4322A    **PIT:** TP SBC022    **DEPTH:** 2.00    **mBGL**

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.63	mBGL
Operator:	M. Bell	
Test Date:	04/03/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.908	m
Soakaway 75% Full:	1.723	m
Soakaway 50% Full:	1.815	m
Test No.:	1 of 1	
Weather Conditions:	Showers	
Test Zone (m):	1.63	to 2.00

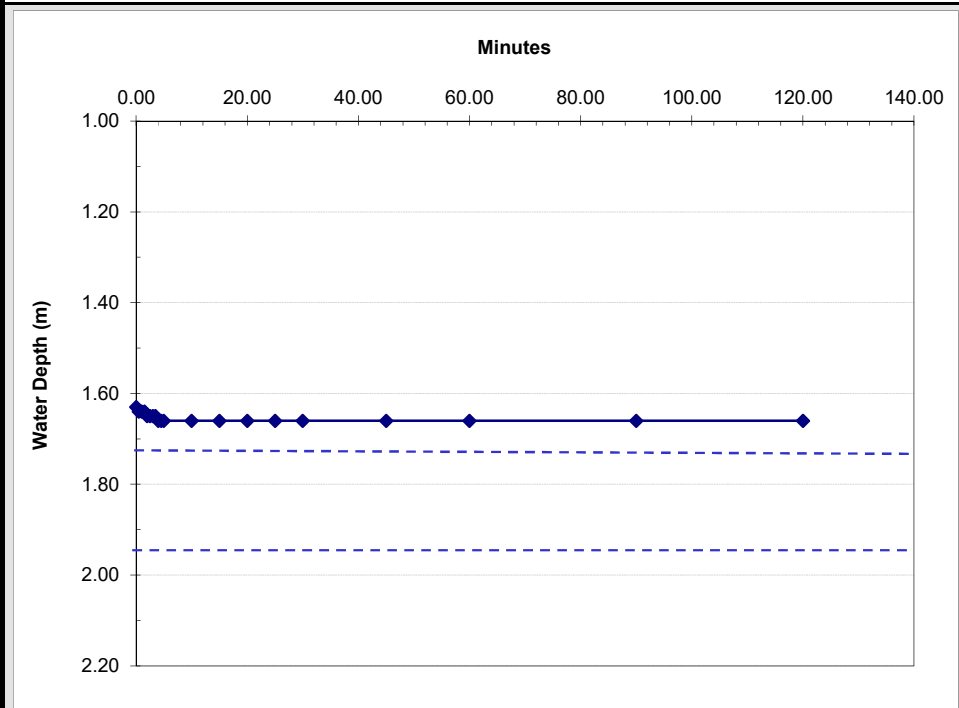
**TEST CALCULATION**

**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.  
 $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area  
 $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.63	Test Start
0.50	1.64	
1.00	1.64	
1.50	1.64	
2.00	1.65	
2.50	1.65	
3.00	1.65	
3.50	1.65	
4.00	1.66	
4.50	1.66	
5.00	1.66	
10.00	1.66	
15.00	1.66	
20.00	1.66	
25.00	1.66	
30.00	1.66	
45.00	1.66	
60.00	1.66	
90.00	1.66	
120.00	1.66	Test Finish



Time (from Graph) 75% Full:	n/a	Minutes
Time (from Graph) 25% Full:	n/a	Minutes
$t_{p75-25} =$	n/a	Minutes

**MATERIAL TYPE**  
 1.10-4.50m: Firm blue sandy gravelly CLAY with low cobble content.

**REMARKS**

(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (f) calculated. (2) Soakaway terminated at 120 minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25} =$	0.370	$m^3$
$a_{p50} =$	3.110	$m^2$
Soil Infiltration Rate (f) =	n/a	m/s
		From (i)

Calculated: K.W    Date: 16/03/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SBC026      DEPTH: 2.00      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.50	m
Soakaway Width:	1.00	m
Filled Water Level:	1.70	mBGL
Operator:	M. Bell	
Test Date:	24/02/2021	

**EFFECTIVE DEPTH DETAILS**

Soakaway 25% Full:	1.925	m
Soakaway 75% Full:	1.775	m
Soakaway 50% Full:	1.850	m
Test No.:	1 of 1	
Weather Conditions:	Moderate Rain	
Test Zone (m):	1.70	to 2.00

**TEST CALCULATION**

Soil Infiltration (*f*)

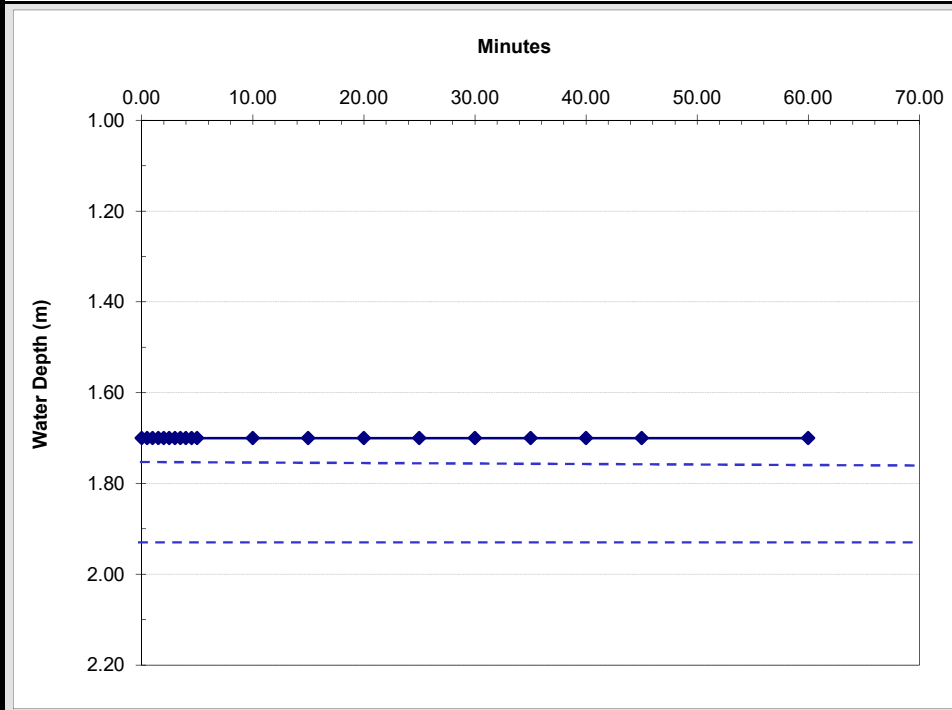
$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

$V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.

$a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area

$t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.70	Test Start
0.50	1.70	
1.00	1.70	
1.50	1.70	
2.00	1.70	
2.50	1.70	
3.00	1.70	
3.50	1.70	
4.00	1.70	
4.50	1.70	
5.00	1.70	
10.00	1.70	
15.00	1.70	
20.00	1.70	
25.00	1.70	
30.00	1.70	
35.00	1.70	
40.00	1.70	
45.00	1.70	
60.00	1.70	Test Finish



Time (from Graph) 75% Full:	n/a	Minutes
Time (from Graph) 25% Full:	n/a	Minutes
$t_{p75-25} = \text{n/a}$ Minutes		

**MATERIAL TYPE**  
 1.20-1.80m: Soft to firm mottled orange dark brown sandy gravelly CLAY with medium cobble content. 1.80-2.40m: Bluish grey very clayey SAND and GRAVEL with medium cobble content.

**REMARKS**

(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (*f*) calculated. (2) Soakaway terminated at 60 minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25}$ =	0.375	$m^3$
$a_{p50}$ =	3.550	$m^2$
Soil Infiltration Rate ( <i>f</i> ) =	n/a	m/s      From (i)

Calculated: KW      Date: 16/03/2021



**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**

Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

SITE: A66 North Trans Pennine Scheme C Section 9

CONTRACT: 4322A      PIT: TP SBC030      DEPTH: 2.00      mBGL

**SOAKAWAY PIT CONDITIONS**

Soakaway Depth:	2.00	mBGL
Soakaway Length:	2.00	m
Soakaway Width:	1.00	m
Filled Water Level:	1.27	mBGL
Operator:	J. Beckitt	
Test Date:	04/03/2021	

**EFFECTIVE DEPTH DETAILS**

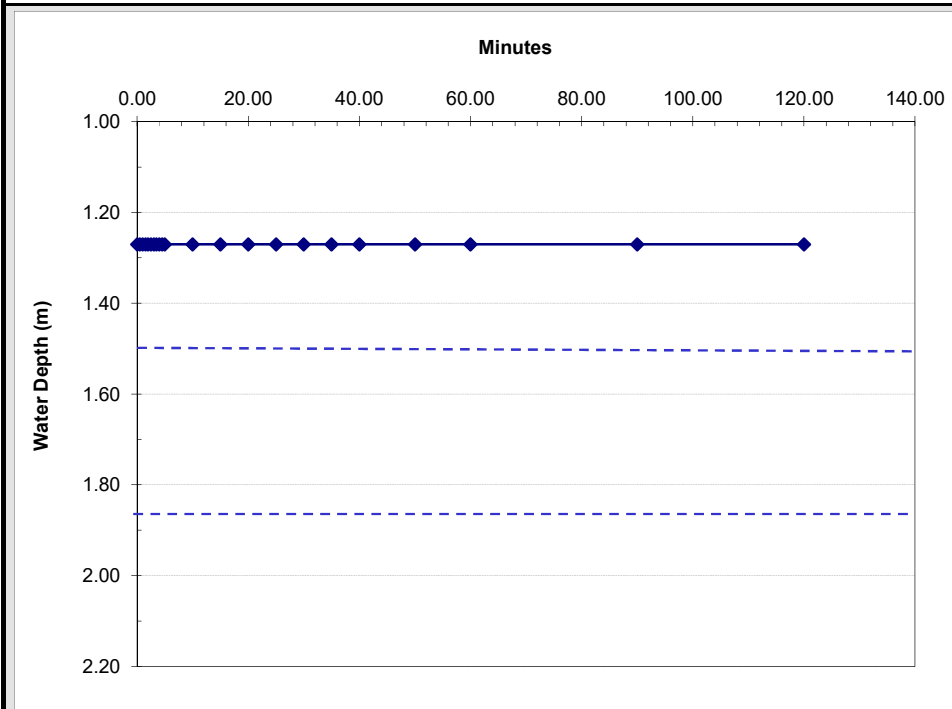
Soakaway 25% Full:	1.818	m
Soakaway 75% Full:	1.453	m
Soakaway 50% Full:	1.635	m
Test No.:	1 of 1	
Weather Conditions:	Clear	
Test Zone (m):	1.27	to 2.00

**TEST CALCULATION**

Soil Infiltration (*f*)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- $V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area
- $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.



Minutes	Water Depth (m)	Remarks
0.00	1.27	Test Start
0.50	1.27	
1.00	1.27	
1.50	1.27	
2.00	1.27	
2.50	1.27	
3.00	1.27	
3.50	1.27	
4.00	1.27	
4.50	1.27	
5.00	1.27	
10.00	1.27	
15.00	1.27	
20.00	1.27	
25.00	1.27	
30.00	1.27	
35.00	1.27	
40.00	1.27	
50.00	1.27	
60.00	1.27	
90.00	1.27	
120.00	1.27	Test Finish

Time (from Graph) 75% Full:	n/a	Minutes
Time (from Graph) 25% Full:	n/a	Minutes
$t_{p75-25} =$	n/a	Minutes

**MATERIAL TYPE**  
0.80-1.70m: Firm brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. 1.70-3.30m: Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY with low cobble content.

**REMARKS**  
(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (*f*) calculated. (2) Soakaway terminated at 120minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25} =$	0.730	$m^3$	
$a_{p50} =$	4.190	$m^2$	
Soil Infiltration Rate ( <i>f</i> ) =	n/a	m/s	From (i)

Calculated: KW      Date: 16/03/2021

**ALLIED EXPLORATION & GEOTECHNICS LTD.**  
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG  
**SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))**  
 Installation Type: Trial Pit

**CONTRACT & POSITION DETAILS**

**SITE:** A66 North Trans Pennine Scheme C Section 9

**CONTRACT:** 4322A      **PIT:** TP SBC040      **DEPTH:** 2.00      **mBGL**

**SOAKAWAY PIT CONDITIONS**

<b>Soakaway Depth:</b>	2.00	mBGL
<b>Soakaway Length:</b>	2.00	m
<b>Soakaway Width:</b>	1.00	m
<b>Filled Water Level:</b>	1.40	mBGL
<b>Operator:</b>	<b>J. Myall</b>	
<b>Test Date:</b>	08/03/2021	

**EFFECTIVE DEPTH DETAILS**

<b>Soakaway 25% Full:</b>	1.850	m
<b>Soakaway 75% Full:</b>	1.550	m
<b>Soakaway 50% Full:</b>	1.700	m
<b>Test No.:</b>	<b>1 of 1</b>	
<b>Weather Conditions:</b>	Overcast	
<b>Test Zone (m):</b>	1.40	to 2.00

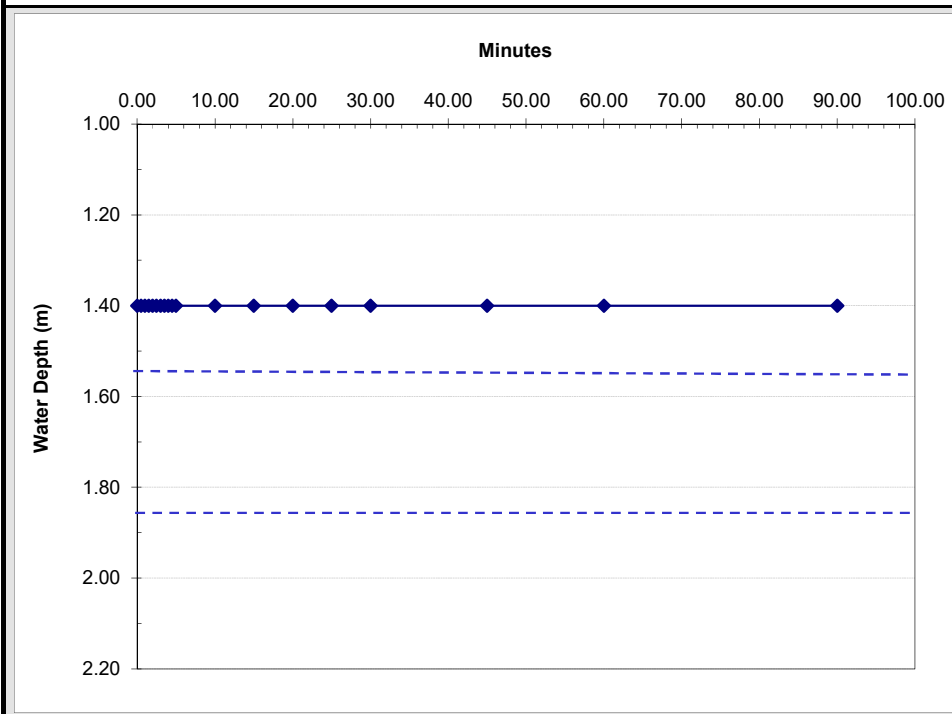
**TEST CALCULATION**

**Soil Infiltration (f)**

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- $V_{p75-25}$  = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- $a_{p50}$  = the internal surface area of the trial pit up to 50% effective depth and including the base area
- $t_{p75-25}$  = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.40	Test Start
0.50	1.40	
1.00	1.40	
1.50	1.40	
2.00	1.40	
2.50	1.40	
3.00	1.40	
3.50	1.40	
4.00	1.40	
4.50	1.40	
5.00	1.40	
10.00	1.40	
15.00	1.40	
20.00	1.40	
25.00	1.40	
30.00	1.40	
45.00	1.40	
60.00	1.40	
90.00	1.40	
		Test Finish



**Time (from Graph) 75% Full:** n/a Minutes  
**Time (from Graph) 25% Full:** n/a Minutes

$t_{p75-25} =$  n/a Minutes

**MATERIAL TYPE**

0.30-2.10m: Soft grey mottled brown and dark grey slightly sandy gravelly CLAY with medium cobble content.

**REMARKS**

(1) Neither the 75% and 25% effective depth level reached during the test. Test should be considered failed – no infiltration (f) calculated. (2) Soakaway terminated at 120minutes.

**SOIL INFILTRATION RESULTS**

$V_{p75-25} =$  0.600 m<sup>3</sup>  
 $a_{p50} =$  3.800 m<sup>2</sup>  
**Soil Infiltration Rate (f) =** n/a m/s **From (i)**

**Calculated:** K.W      **Date:** 16/03/2021



## Plate Load Test Results



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

**In-Situ Plate Load Test**

BS 1377 : Part 9 : 1990

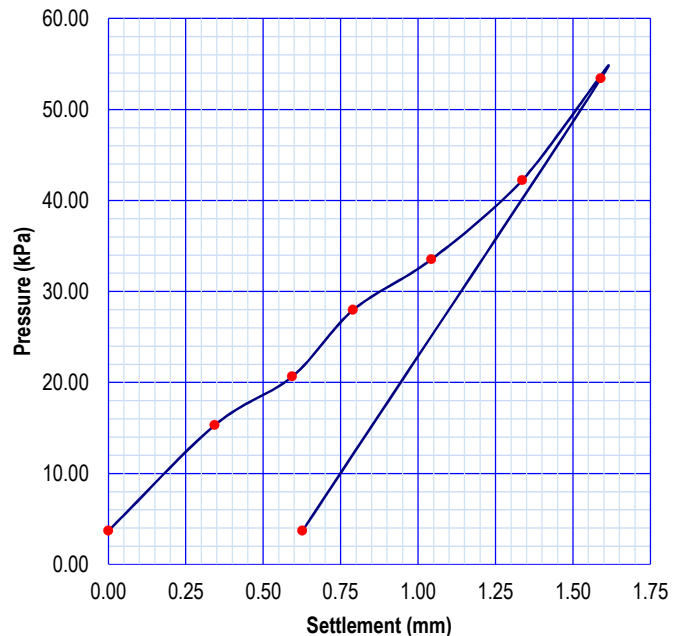
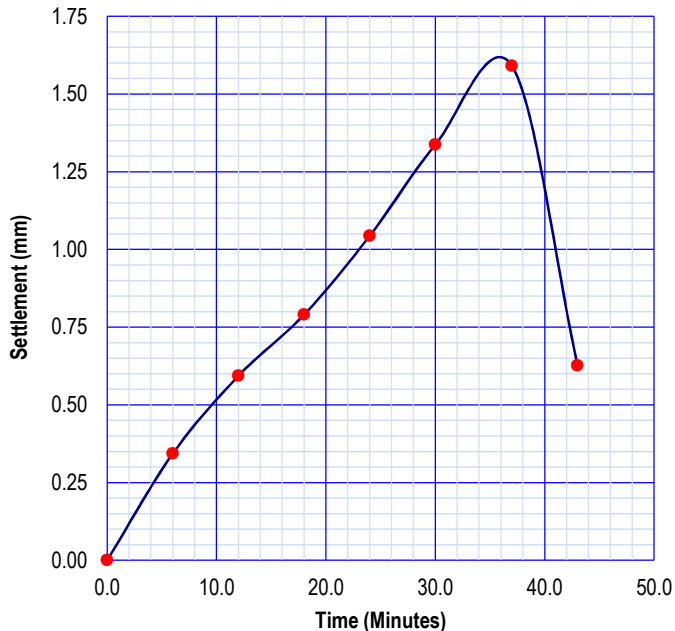
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b>	<b>A66 North Trans Pennine Scheme C Section 9</b>			
<b>Client:</b>	AMEY			<b>Project No.:</b> 4322A
<b>Test Position:</b>	TP SBC02	<b>Depth (mBGL):</b>	0.40	<b>Operator:</b> JM
<b>Date of Test:</b>	26/02/2021	<b>Plate Diameter (mm):</b>	453	<b>Plate Area (m2):</b> 0.16117
<b>Reaction Load:</b>	JCB 3CX (8T)			<b>Sample:</b> Yes
<b>Weather:</b>	Raining			<b>Equipment Mass (Kg):</b> 60.57
<b>Test Type:</b>	Incremental - Equivalent CBR			<b>Equipment Force (kN):</b> 0.594
<b>Material Type:</b>	Soft to firm orange brown slightly sandy slightly gravelly CLAY			
<b>Remarks:</b>	Self weight of the equipment calculated at 3.69 kPa (i.e. plate, extension rod, jack piston and load cell).			

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.69	0.00	0.000
1	6.0	1.87	15.29	0.34	0.022
2	12.0	2.73	20.62	0.59	0.029
3	18.0	3.91	27.95	0.79	0.028
4	24.0	4.81	33.53	1.04	0.031
5	30.0	6.21	42.22	1.34	0.032
6	37.0	8.01	53.38	1.59	0.030
7	43.0	0.00	3.69	0.63	0.170

<b>Plate Penetration (mm):</b>	1.25	<b>k762:</b>	19552.3	<b>kN/m2/m</b>
<b>Plate Load @1.25mm (kPa):</b>	39.00	<b>Equivalent CBR:</b>	1.67	<b>%</b>
<b>Plate Factor:</b>	0.6267	<b>Subgrade Mod (E):</b>	24.41	<b>MN/m2</b>
<b>Penetration Comment:</b>	1.25mm achieved at given pressure			



<b>Certificate:</b>	4322A/TP SBC02	<b>End Remark:</b>	Tested in accordance with specification	
<b>Calculated:</b>	KW	<b>Moisture Content:</b>	24.00	<b>%</b>
<b>Approved:</b>	N. Vater	<b>Test Certificate:</b>	1 of 1	
<b>Signed:</b>	08/09/2021	<b>CBR Reference:</b>	Interim Advice Note 73/06 (2009)	



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

## In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

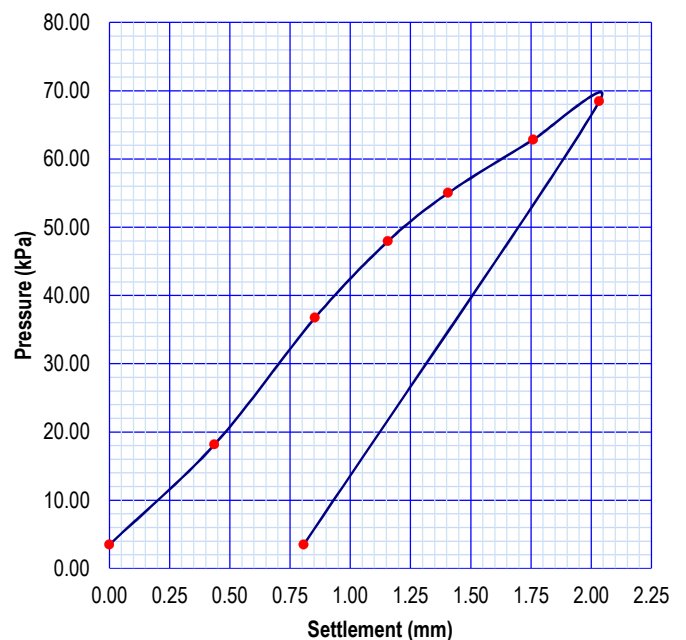
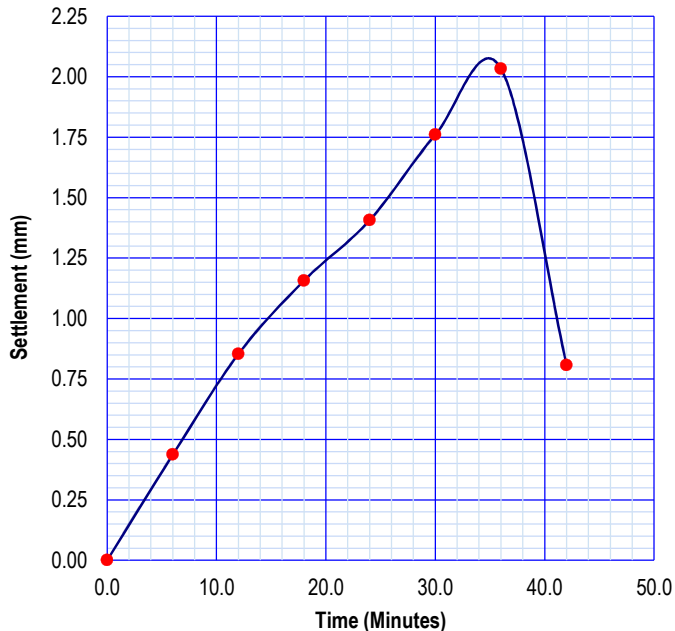
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b> A66 North Trans Pennine Scheme C Section 9	
<b>Client:</b> AMEY	<b>Project No.:</b> 4322A
<b>Test Position:</b> TP SBC010	<b>Depth (mBGL):</b> 0.50
<b>Date of Test:</b> 23/02/2021	<b>Operator:</b> JM
<b>Reaction Load:</b> JCB 3CX (8T)	<b>Plate Area (m<sup>2</sup>):</b> 0.16117
<b>Weather:</b> Overcast	<b>Sample:</b> Yes
<b>Test Type:</b> Incremental - Equivalent CBR	<b>Equipment Mass (Kg):</b> 56.60
<b>Material Type:</b> Soft grey mottled orange brown very sandy slightly gravelly CLAY	<b>Equipment Force (kN):</b> 0.555
<b>Remarks:</b> Self weight of the equipment calculated at 3.44kPa (i.e. plate, extension rod, jack piston and load cell).	

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.44	0.00	0.000
1	6.0	2.37	18.15	0.44	0.024
2	12.0	5.36	36.70	0.85	0.023
3	18.0	7.17	47.93	1.16	0.024
4	24.0	8.31	55.00	1.41	0.026
5	30.0	9.57	62.82	1.76	0.028
6	36.0	10.47	68.41	2.03	0.030
7	42.0	0.00	3.44	0.81	0.234

<b>Plate Penetration (mm):</b> 1.25	<b>k762:</b> 25568.4	<b>kN/m<sup>2</sup>/m</b>
<b>Plate Load @1.25mm (kPa):</b> 51.00	<b>Equivalent CBR:</b> 2.65	<b>%</b>
<b>Plate Factor:</b> 0.6267	<b>Subgrade Mod (E):</b> 32.87	<b>MN/m<sup>2</sup></b>
<b>Penetration Comment:</b> 1.25mm achieved at given pressure		



<b>Certificate:</b> 4322C/TP SBC010	<b>End Remark:</b> Tested in accordance with specification
<b>Calculated:</b> KW	<b>Moisture Content:</b> 21.00 %
<b>Approved:</b> N. Vater	<b>Test Certificate:</b> 1 of 1
<b>Signed:</b> 08/09/2021	<b>CBR Reference:</b> Interim Advice Note 73/06 (2009)

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

## In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

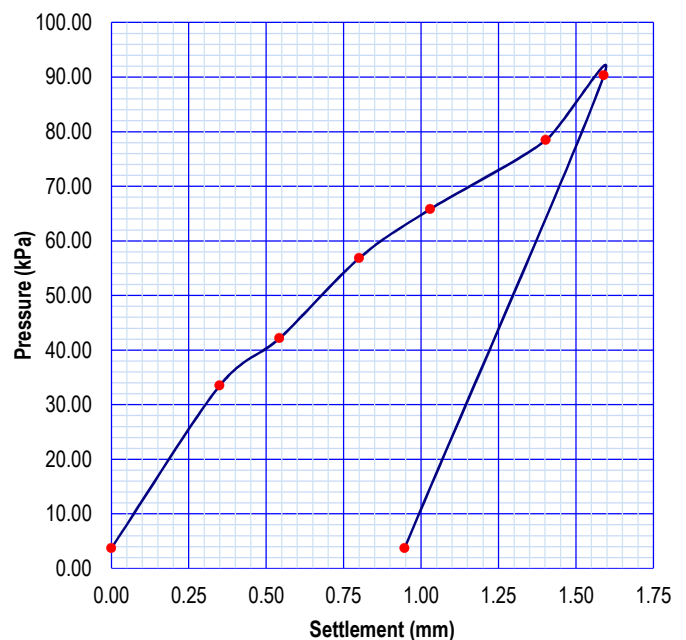
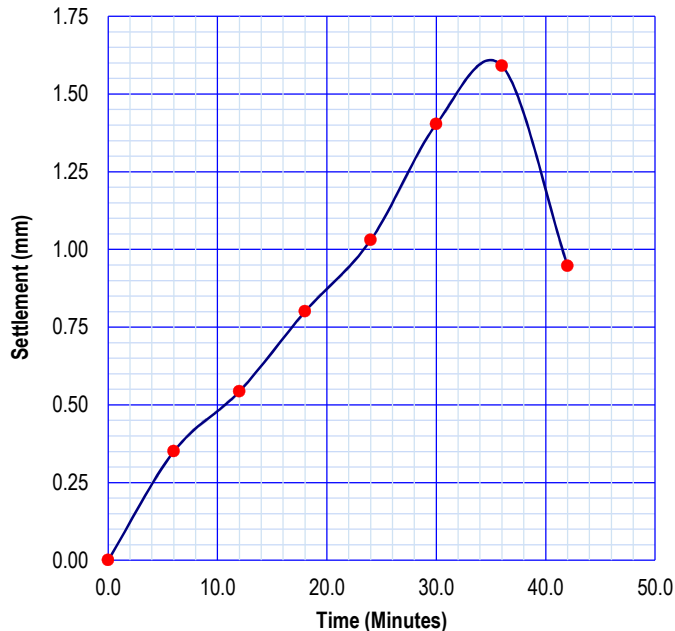
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b> A66 North Trans Pennine Scheme C Section 9	
<b>Client:</b> AMEY	<b>Project No.:</b> 4322A
<b>Test Position:</b> TP SBC020	<b>Depth (mBGL):</b> 0.50
<b>Date of Test:</b> 02/03/2021	<b>Operator:</b> JM
<b>Reaction Load:</b> JCB 3CX (8T)	<b>Plate Area (m2):</b> 0.16117
<b>Weather:</b> Clear	<b>Sample:</b> Yes
<b>Test Type:</b> Incremental - Equivalent CBR	<b>Equipment Mass (Kg):</b> 60.57
<b>Material Type:</b> Firm yellowish brown mottled grey slightly sandy slightly gravelly CLAY	<b>Equipment Force (kN):</b> 0.594
<b>Remarks:</b> Self weight of the equipment calculated at 3.69kPa (i.e. plate, extension rod, jack piston and load cell).	

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.69	0.00	0.000
1	6.0	4.80	33.47	0.35	0.010
2	12.0	6.20	42.15	0.54	0.013
3	18.0	8.56	56.80	0.80	0.014
4	24.0	10.01	65.79	1.03	0.016
5	30.0	12.05	78.45	1.40	0.018
6	36.0	13.96	90.30	1.59	0.018
7	42.0	0.00	3.69	0.95	0.257

<b>Plate Penetration (mm):</b> 1.25	<b>k762:</b> 36597.9	<b>kN/m2/m</b>
<b>Plate Load @1.25mm (kPa):</b> 73.00	<b>Equivalent CBR:</b> 4.94	<b>%</b>
<b>Plate Factor:</b> 0.6267	<b>Subgrade Mod (E):</b> 48.93	<b>MN/m2</b>
<b>Penetration Comment:</b> 1.25mm achieved at given pressure		



<b>Certificate:</b> 4322C/TP SBC020	<b>End Remark:</b> Tested in accordance with specification
<b>Calculated:</b> KW	<b>Moisture Content:</b> 20.00 %
<b>Approved:</b> N. Vater	<b>Test Certificate:</b> 1 of 1
<b>Signed:</b> 08/09/2021	<b>CBR Reference:</b> Interim Advice Note 73/06 (2009)



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

## In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

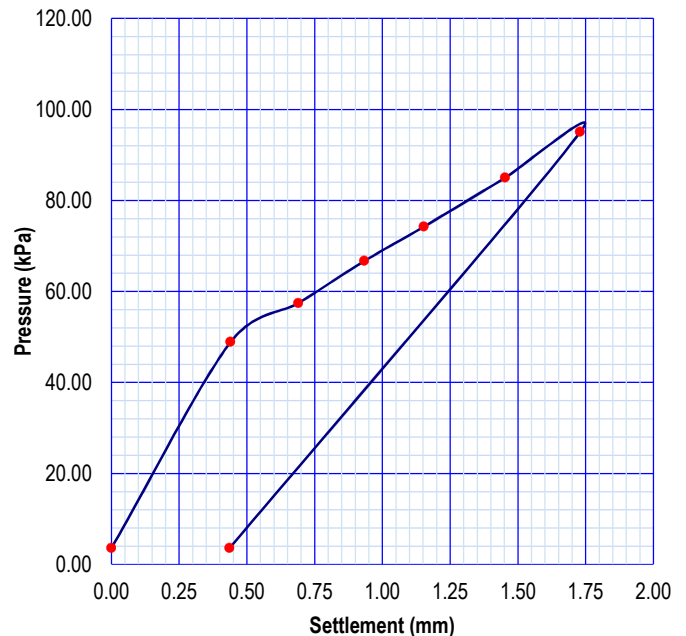
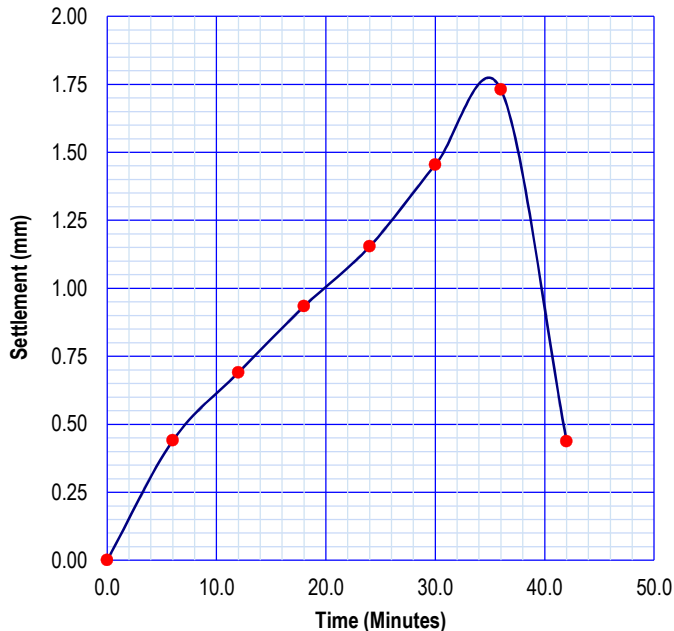
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b> A66 North Trans Pennine Scheme C Section 9	
<b>Client:</b> AMEY	<b>Project No.:</b> 4322A
<b>Test Position:</b> TP SBC023	<b>Depth (mBGL):</b> 0.40
<b>Date of Test:</b> 03/03/2021	<b>Operator:</b> JM
<b>Reaction Load:</b> JCB 3CX (8T)	<b>Plate Area (m<sup>2</sup>):</b> 0.16117
<b>Weather:</b> Foggy	<b>Sample:</b> Yes
<b>Test Type:</b> Incremental - Equivalent CBR	<b>Equipment Mass (Kg):</b> 58.66
<b>Material Type:</b> Yellow clayey slightly gravelly SAND	<b>Equipment Force (kN):</b> 0.575
<b>Remarks:</b> Self weight of the equipment calculated at 3.57kPa (i.e. plate, extension rod, jack piston and load cell).	

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.57	0.00	0.000
1	6.0	7.30	48.86	0.44	0.009
2	12.0	8.68	57.43	0.69	0.012
3	18.0	10.17	66.67	0.93	0.014
4	24.0	11.39	74.24	1.15	0.016
5	30.0	13.12	84.97	1.45	0.017
6	36.0	14.74	95.02	1.73	0.018
7	42.0	0.00	3.57	0.44	0.122

<b>Plate Penetration (mm):</b> 1.25	<b>k762:</b> 39104.6	<b>kN/m<sup>2</sup>/m</b>
<b>Plate Load @1.25mm (kPa):</b> 78.00	<b>Equivalent CBR:</b> 5.54	<b>%</b>
<b>Plate Factor:</b> 0.6267	<b>Subgrade Mod (E):</b> 52.66	<b>MN/m<sup>2</sup></b>
<b>Penetration Comment:</b> 1.25mm achieved at given pressure		



<b>Certificate:</b> 4322C/TP SBC023	<b>End Remark:</b> Tested in accordance with specification
<b>Calculated:</b> KW	<b>Moisture Content:</b> 17.00 %
<b>Approved:</b> N. Vater	<b>Test Certificate:</b> 1 of 1
<b>Signed:</b> 08/09/2021	<b>CBR Reference:</b> Interim Advice Note 73/06 (2009)

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

## In-Situ Plate Load Test

BS 1377 : Part 9 : 1990

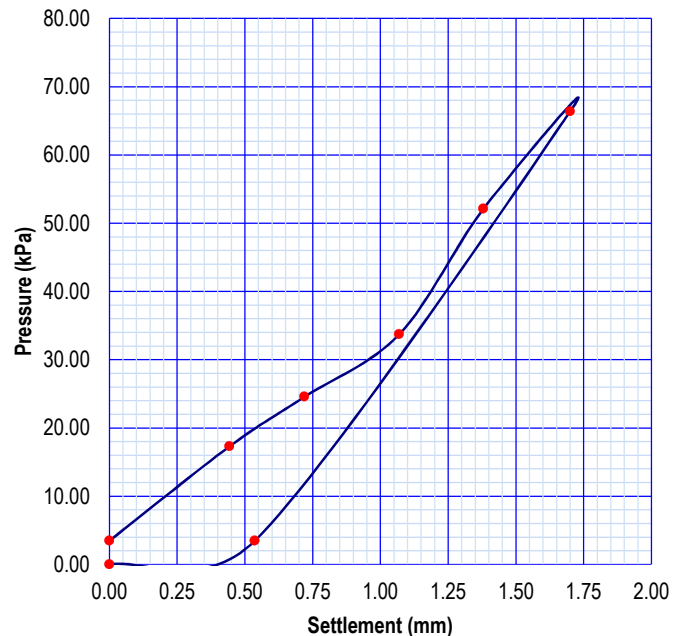
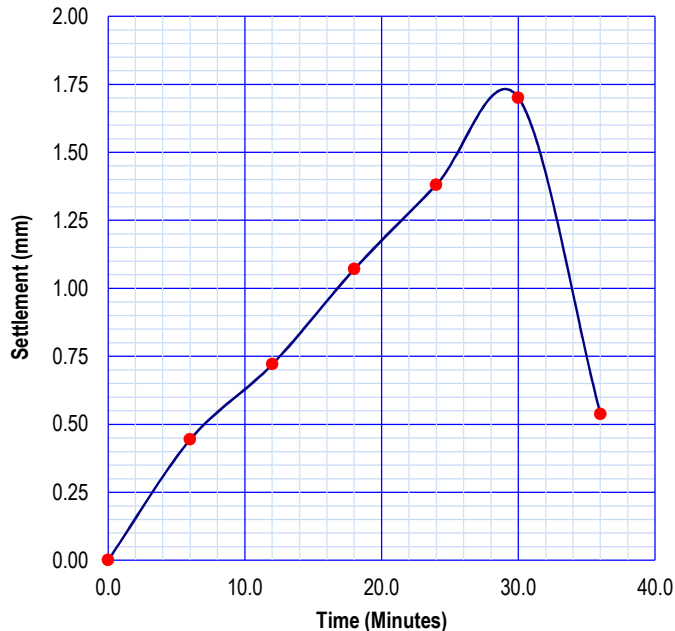
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b> A66 North Trans Pennine Scheme C Section 9	
<b>Client:</b> AMEY	<b>Project No.:</b> 4322A
<b>Test Position:</b> TP SBC027	<b>Depth (mBGL):</b> 0.50
<b>Date of Test:</b> 25/02/2021	<b>Operator:</b> JM
<b>Reaction Load:</b> JCB 3CX (8T)	<b>Plate Area (m<sup>2</sup>):</b> 0.16117
<b>Weather:</b> Clear	<b>Sample:</b> Yes
<b>Test Type:</b> Incremental - Equivalent CBR	<b>Equipment Mass (Kg):</b> 56.60
<b>Material Type:</b> Soft bluish mottled grey orangish brown very sandy gravelly CLAY	<b>Equipment Force (kN):</b> 0.555
<b>Remarks:</b> Self weight of the equipment calculated at 3.44kPa (i.e. plate, extension rod, jack piston and load cell).	

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.44	0.00	0.000
1	6.0	2.23	17.28	0.44	0.026
2	12.0	3.40	24.54	0.72	0.029
3	18.0	4.88	33.72	1.07	0.032
4	24.0	7.84	52.09	1.38	0.026
5	30.0	10.14	66.36	1.70	0.026
6	36.0	0.00	3.44	0.54	0.156

<b>Plate Penetration (mm):</b> 1.25	<b>k762:</b> 22560.4	<b>kN/m<sup>2</sup>/m</b>
<b>Plate Load @1.25mm (kPa):</b> 45.00	<b>Equivalent CBR:</b> 2.14	<b>%</b>
<b>Plate Factor:</b> 0.6267	<b>Subgrade Mod (E):</b> 28.61	<b>MN/m<sup>2</sup></b>
<b>Penetration Comment:</b> 1.25mm achieved at given pressure		



<b>Certificate:</b> 4322C/TP SBC023	<b>End Remark:</b> Tested in accordance with specification
<b>Calculated:</b> KW	<b>Moisture Content:</b> 20.60 %
<b>Approved:</b> N. Vater	<b>Test Certificate:</b> 1 of 1
<b>Signed:</b> 08/09/2021	<b>CBR Reference:</b> Interim Advice Note 73/06 (2009)



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

**In-Situ Plate Load Test**

BS 1377 : Part 9 : 1990

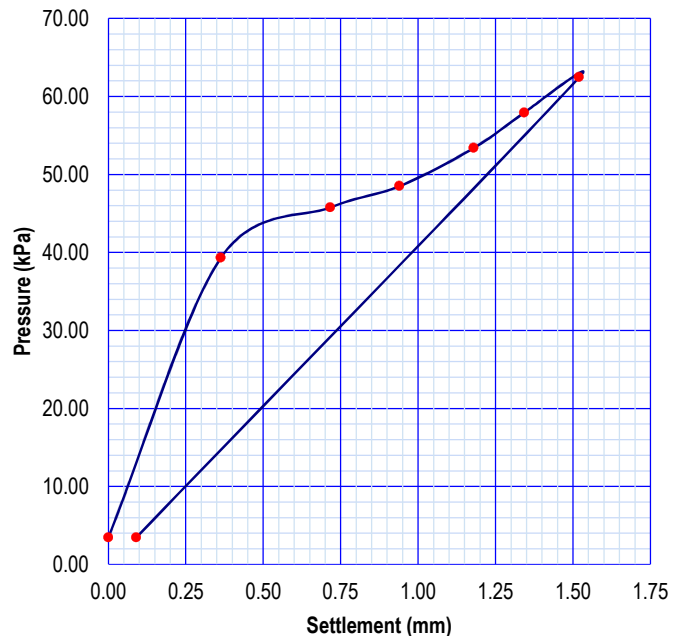
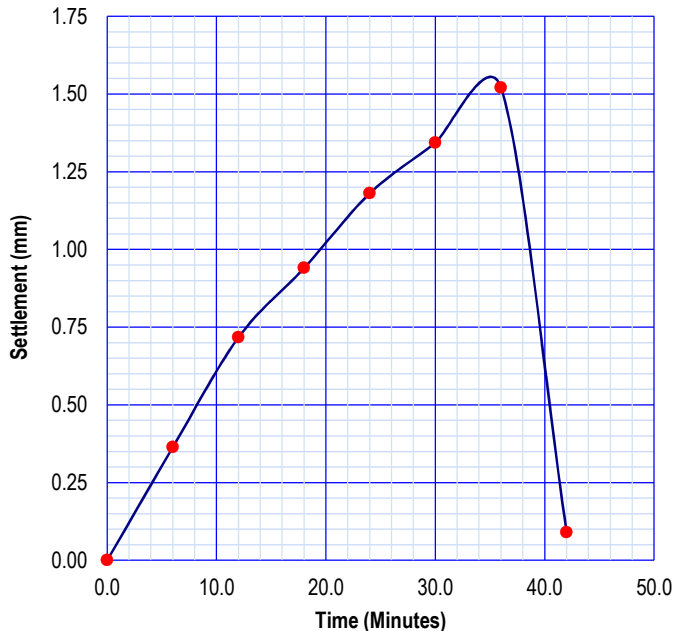
Unit 25 Stella Gill Industrial Estate Pelton Fell Chester-le-Street County Durham DH2 2RG.

email: enquiries@aeg.uk.net

<b>Project Title:</b>	<b>A66 North Trans Pennine Scheme C Section 9</b>		
<b>Client:</b>	AMEY	<b>Project No.:</b>	4322A
<b>Test Position:</b>	TP SBC034	<b>Depth (mBGL):</b>	0.45
<b>Date of Test:</b>	01/03/2021	<b>Plate Diameter (mm):</b>	453
<b>Reaction Load:</b>	JCB 3CX (8T)	<b>Plate Area (m2):</b>	0.16117
<b>Weather:</b>	Overcast	<b>Sample:</b>	Yes
<b>Test Type:</b>	Incremental - Equivalent CBR	<b>Equipment Mass (Kg):</b>	56.60
<b>Material Type:</b>	Soft blue grey mottled orangish brown sandy slightly gravelly CLAY		
<b>Remarks:</b>	Self weight of the equipment calculated at XXXkPa (i.e. plate, extension rod, jack piston and load cell).		

Load Stage	Time	Force	Pressure	Av. Penetration	Av. Pene
	Minutes	kN	kPa	(mm)	mm/kPa
0	0.0	0.00	3.44	0.00	0.000
1	6.0	5.78	39.31	0.36	0.009
2	12.0	6.82	45.76	0.72	0.016
3	18.0	7.26	48.49	0.94	0.019
4	24.0	8.05	53.39	1.18	0.022
5	30.0	8.78	57.92	1.34	0.023
6	36.0	9.51	62.45	1.52	0.024
7	42.0	0.00	3.44	0.09	0.026

<b>Plate Penetration (mm):</b>	1.25	<b>k762:</b>	27573.8	<b>kN/m2/m</b>
<b>Plate Load @1.25mm (kPa):</b>	55.00	<b>Equivalent CBR:</b>	3.02	<b>%</b>
<b>Plate Factor:</b>	0.6267	<b>Subgrade Mod (E):</b>	35.74	<b>MN/m2</b>
<b>Penetration Comment:</b>	1.25mm achieved at given pressure			



<b>Certificate:</b>	4322C/TP SBC034	<b>End Remark:</b>	Tested in accordance with specification
<b>Calculated:</b>	KW	<b>Moisture Content:</b>	21.00 %
<b>Approved:</b>	N. Vater	<b>Test Certificate:</b>	1 of 1
<b>Signed:</b>	08/09/2021	<b>CBR Reference:</b>	Interim Advice Note 73/06 (2009)

## Laboratory Report Certificate





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T



## LABORATORY REPORT CERTIFICATE



**Contract Title:** A66 North Trans Pennine Scheme C Section 9 **AEG Reference:** 4322A

**Client Address:** AMEY OW Limited  
Chancery Exchange  
10 Furnival Street  
London  
EC4A 1AB

We certify that Laboratory testing was carried out on samples from the above contract in accordance with techniques outlined in BS 1377: 1990, BS EN ISO 17892:2014 or other appropriate standards as quoted. The samples were received from January 2021 and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

Nick Vater (Managing Director)

Michelle Selkirk (Laboratory Manager)

Signed

A large black rectangular box redacting the signature of the Laboratory Manager.

Date: 20 July 2021

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

Please note the material was derived from samples taken outside the control of the laboratory.

# LABORATORY REPORT CERTIFICATE

## ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Laboratory Report Certificate	N/A		3
1	Sample Description Sheets	N/A		21
2	Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	3
2	Plasticity Index and Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	13
3	Determination of Density by Linear Measurement	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-2:2014)	1
4	Determination of Particle Density	Yes	BS 1377 Part 2 1990	4
5	Particle Size Distribution Sieving	Yes	BS 1377 Part 2 1990	81
5	Particle Size Distribution Sedimentation	No	BS 1377 Part 2 1990	80
6	Determination of Total Sulphur, Sulphate and pH (Tested externally)	No	See DETS certificates	15
7	Determination of Dry Density/Moisture Content Relationship	Yes	BS 1377 Part 4 1990	24
8	Determination of Moisture Condition Value	Yes	BS 1377 Part 4 1990	47
9	Determination of MCV / Moisture Relationship	Yes	BS 1377 Part 4 1990	30
10	Determination of California Bearing Ratio	Yes	BS 1377 Part 4 1990	17
11	Determination of One Dimensional Consolidation Properties	Yes	BS 1377 Part 5 1990	14
12	Shear Strength by Hand Vane	No		5
13	Shear Strength by Direct Shear	Yes	BS 1377 Part 7 1990	30
14	Undrained Shear Strength in Triaxial Cell without Pore Water Pressure Measurement	Yes	BS 1377 Part 7 1990	3
15	Consolidated Undrained Shear Strength in Triaxial Cell with Measurement of Pore Pressure	No	BS 1377 Part 8 1990	93
16	Moisture Content of Rock (Some tested externally)	Yes	ISRM 1981	2
17	Determination of Point Load Index	Yes	ISRM 1985	10
18	Determination of Unconfined Compressive Strength (Tested externally)	No	ISRM 1985	1



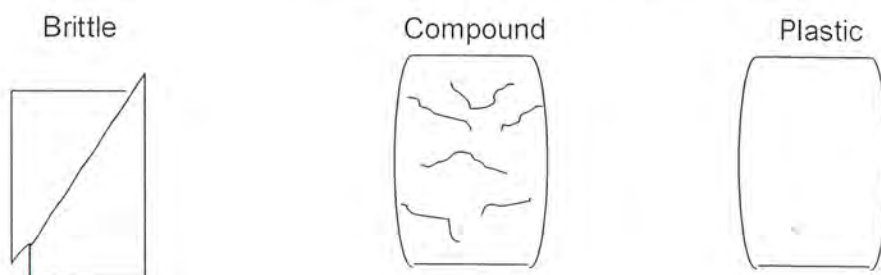
# LABORATORY REPORT CERTIFICATE

## ABBREVIATIONS

All the abbreviations used on the laboratory certificates are given below:

<b>Br</b>	Brittle	<b>PSD</b>	Particle Size Distribution by sieve analysis
<b>C</b>	Compound	<b>SB</b>	Shear Box
<b>CBR</b>	California Bearing Ratio	<b>SED</b>	Sedimentation Analysis
<b>CDT</b>	Consolidated Drained Triaxial	<b>SO4</b>	Sulphate (total, water extract, groundwater)
<b>CL</b>	Chloride content (water or soil)	<b>CP2</b>	Dry Density/Moisture Content 2.5kg rammer
<b>US</b>	Unsuitable sample for test	<b>CP4</b>	As above using 4.5kg rammer
<b>UUT</b>	Undrained Unconsolidated Triaxial	<b>CPV</b>	As above using vibrating hammer
<b>HSV</b>	Vane Test	<b>CUT</b>	Consolidated Undrained Triaxial
<b>IS</b>	Insufficient sample for test	<b>R</b>	Remoulded
<b>LOI</b>	Loss On Ignition	<b>U</b>	Undisturbed
<b>M</b>	Multi-stage testing	<b>MC</b>	Moisture Content
<b>MCV</b>	Moisture Content Value	<b>PL</b>	Point Load
<b>NAT</b>	Natural preparation method	<b>NMC</b>	Natural (or as received) moisture content
<b>P</b>	Plastic	<b>PFH</b>	Permeability Falling Head Method
<b>OED</b>	Oedometer	<b>PTXL</b>	Permeability in Triaxial Cell
<b>OMC</b>	Optimum Moisture Content	<b>ORG</b>	Organic content
<b>B</b>	Large disturbed (bulk) sample	<b>PD</b>	Particle Density (SG)
<b>J</b>	Small disturbed (jar) sample	<b>PI</b>	Liquid limit, plastic limit and plasticity index

### Typical Mode of Failure for Triaxial Testing



## Sample Description Sheets







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pallon Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC001	0.20 J2	Brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC001	0.50 J4	Brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC001	0.50 B5	Brown slightly sandy slightly gravelly CLAY with a high cobble content.	PSD SED
BH SBC002	0.80 J3	Grey with orange mottling slightly sandy CLAY of high plasticity.	MC PI
BH SBC002	1.50 J5	Light brown with orange and grey mottling slightly sandy CLAY.	MC
BH SBC002	2.50 U8	Very low strength brown slightly sandy slightly gravelly CLAY.	UUT OED
BH SBC002	3.00 J9	Light brown sandy gravelly CLAY of low plasticity.	MC PI
BH SBC002	5.20 J14	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC005	0.00 B3	Brown slightly sandy slightly gravelly CLAY.	PD CP4 MCV
BH SBC005	0.20 J2	Brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC005	1.00 J5	Light brown with orange and grey mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC005	1.20 J6	Light brown with orange mottling slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC005	1.20 B7	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC005	2.50 J9	Light brown grey sandy gravelly CLAY.	BRE
BH SBC005	2.50 B10	Brown slightly sandy slightly gravelly CLAY.	CBR US for MCV
BH SBC006	1.00 J5	Orange brown slightly clayey SAND.	MC
BH SBC006	1.20 J7	Light brown with orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC006	2.50 J11	Brown slightly sandy slightly gravelly CLAY of low to intermediate plasticity.	MC PI
BH SBC006	2.50 B12	Brown slightly sandy slightly gravelly CLAY.	Density US for MCV
BH SBC006	4.50 J17	Friable fissured dark grey slightly gravelly CLAY of low plasticity/MUDSTONE.	MC PI
BH SBC007	0.20 J2	Brown sandy slightly gravelly CLAY.	MC

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	Sign [Redacted Signature]	Name :- <div style="border: 2px solid red; padding: 5px; display: inline-block;"><b>M. SELKIRK</b></div>	Page 1 of 21	
	Date of issue :- 07/09/2021	Certificate No :- SD/4322A/1	AEG Contract No. :- 4322A	



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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC007	1.00	J5	Light brown with orange and grey mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC007	1.00	B6	Light brown slightly sandy slightly gravelly CLAY.	Density PSD SED
BH SBC007	1.20	J7	Brown with orange mottling slightly sandy slightly gravelly CLAY of high plasticity.	MC PI
BH SBC007	1.20	B8	Brown slightly sandy slightly gravelly CLAY.	CBR MCV
BH SBC007	2.00	J10	Friable dark grey with orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC007	2.00	B11	Brown slightly sandy slightly gravelly CLAY.	PD CP4 IS for MCV
BH SBC007	3.00	J13	Brown slightly sandy CLAY of intermediate plasticity.	MC PI
BH SBC008	0.30	B3	MADE GROUND (Dark grey slightly clayey sandy gravel including ash with many rootlets).	PSD
BH SBC008	1.20	J7	Light brown sandy gravelly CLAY.	MC PI (IS for LL)
BH SBC008	2.50	J11	Light brown sandy gravelly CLAY of low plasticity.	MC PI
BH SBC008	4.00	J15	Dark grey with orange mottling slightly sandy CLAY.	BRE
BH SBC009	0.20	J2	Brown slightly sandy slightly gravelly CLAY of low to intermediate plasticity.	MC PI
BH SBC009	1.00	J5	Light brown with grey and orange veining sandy CLAY of low plasticity.	MC PI
BH SBC009	1.20	B8	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC009	2.00	B10	Brown slightly sandy slightly gravelly CLAY.	MC
BH SBC009	4.00	J14	Brown slightly sandy CLAY of low plasticity.	MC PI
BH SBC010	0.05	J1	Light brown sandy CLAY with occasional rootlets.	MC
BH SBC010	0.25	J4	Light brown with orange and grey mottling slightly sandy CLAY of high plasticity.	MC PI
BH SBC010	0.25	B5	Brown sandy slightly gravelly CLAY. Gravel of weathered mudstone.	PSD SED
BH SBC010	1.50	U8	High strength brown with orange and grey mottling sandy gravelly CLAY	HSV UUT
BH SBC010	2.30	J11	Dark grey slightly sandy slightly gravelly CLAY of low plasticity with some sand pockets.	MC PI

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Page 2 of 21

Date of issue :-

07/09/2021

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SD/4322A/2

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC010A	3.70	J2	Black/dark grey sandy gravelly CLAY of low plasticity. Gravel of weathered mudstone.	MC PI
BH SBC011	0.30	J5	Light brown sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC011	2.30	J10	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC011	3.30	U13	Very low strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC011	4.30	J16	Friable grey slightly sandy slightly gravelly CLAY with sand pockets.	BRE
BH SBC011	4.30	B17	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC011	5.10	J18	Dark grey slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC011	5.40	B19	Brown slightly sandy slightly gravelly CLAY with a medium cobble content.	PSD SED
BH SBC011	6.20	U20	Very high strength grey slightly sandy gravelly CLAY.	HSV MCUT
BH SBC012	1.30	U10	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC012	2.30	B15	Friable brown slightly sandy slightly gravelly CLAY.	MCV
BH SBC012	4.00	J21	Grey brown slightly sandy gravelly CLAY.	MC
BH SBC012	5.20	B24	Dark grey sandy gravelly CLAY with a low cobble content.	PD CP4 IS for MCV
BH SBC012	5.80	J26	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC012	5.90	U27	Very high strength dark brown slightly sandy gravelly CLAY.	HSV MCUT
BH SBC012	6.35	J28	Fissured grey brown CLAY of low plasticity with silt lenses/bands.	MC PI
BH SBC012	6.90	J29	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC012	7.60	J31	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC012	7.60	B32	Brown slightly sandy slightly gravelly CLAY.	Density PSD SED CBR SB
BH SBC012	8.50	J33	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC012	9.00	U35	High strength brown slightly sandy slightly gravelly CLAY.	HSV MUUT

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	Date of issue :- 07/09/2021	Certificate No :- SD/4322A/3	AEG Contract No. :- 4322A	



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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC013	1.50 U5	Low strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC013	2.20 B7	Dark brown slightly sandy slightly gravelly CLAY.	MCV
BH SBC013	2.50 J8	Grey with orange mottling slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC013	3.50 U12	Soft dark grey slightly sandy gravelly CLAY.	HSV MCUT
BH SBC013	4.20 B14	Grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC013	5.20 J18	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC013	5.50 U19	Low strength grey slightly sandy slightly gravelly CLAY.	HSV MUUT
BH SBC013	6.00 J20	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC013	6.40 B22	Grey slightly sandy slightly gravelly CLAY.	US for MCV
BH SBC013	7.00 J24	Dark grey slightly sandy slightly gravelly CLAY.	MC
BH SBC013	7.00 B25	Dark grey slightly sandy slightly gravelly CLAY.	US for MCV
BH SBC013	8.20 J27	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC013	8.50 B28	Brown silty slightly sandy slightly gravelly CLAY.	PSD SED PD CP4 MCV
BH SBC013	9.00 J29	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC013	9.70 B30	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC013	10.00 J31	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC013	10.00 B32	Brown slightly sandy slightly gravelly CLAY.	Density CBR
BH SBC014A	0.70 J3	Light brown slightly sandy gravelly CLAY of intermediate plasticity.	MC PI
BH SBC014A	1.50 U5	Stiff and very stiff brown and dark brown slightly sandy slightly gravelly CLAY. Gravel includes sandstone.	US for HSV and CUT
BH SBC014A	3.50 U11	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC014A	4.50 J14	Grey silty CLAY of high plasticity.	MC PI

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A66 North Trans Pennine Scheme C Section 9

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Name :-

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Page 4 of 21

Date of issue :-

07/09/2021

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SD/4322A/4

AEG Contract No. :-

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC014A	4.50 B15	grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC014A	5.20 J16	Dark grey slightly sandy slightly gravelly CLAY with occasional rootlets.	BRE
BH SBC014A	5.50 U17	High strength brown slightly sandy slightly gravelly CLAY.	MUUT OED
BH SBC014A	6.70 J20	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC014A	7.00 J21	Grey silty slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC014A	15.30 C29	Very high strength grey sandy gravelly CLAY.	MUUT
BH SBC015	3.50 U10	Medium strength brown grey slightly sandy slightly gravelly CLAY.	HSV US for CUT
BH SBC015	4.20 B12	Grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC015	7.00 U20	Medium strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC015	7.50 J21	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC015	10.00 U28	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC015	11.50 J32	Brown slightly sandy slightly gravelly CLAY.	MC IS for PI
BH SBC015	13.00 B37	Grey brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC015	13.70 J38	Fissured grey brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC015	16.00 J44	Grey brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC016	0.50 B2	Brown clayey very sandy GRAVEL with a high cobble content.	PSD SED
BH SBC016	0.70 J3	Brown sandy gravelly CLAY of low plasticity.	MC PI
BH SBC016	4.50 J12	Grey sandy gravelly CLAY of low plasticity.	MC PI
BH SBC016	5.50 U15	Low strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC017	0.70 J3	Brown with orange mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC017	2.50 U8	Soft and firm brown slightly sandy slightly gravelly CLAY with pockets of brown silty clay.	MCUT OED

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Page 5 of 21

Date of issue :- 07/09/2021

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC017	3.20	B10	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC017	3.50	J11	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC017	4.50	U14	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC017	7.00	U21	Stiff dark brown slightly sandy gravelly CLAY.	HSV MCUT
BH SBC018	0.80	J3	Brown grey slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC018	1.50	J5	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC018	1.50	B6	Brown very clayey sandy GRAVEL with medium cobble content.	PSD SED PD US for CP4 and MCV
BH SBC019	1.20	J7	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC019	3.50	B14	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC019	5.00	J16	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC020	0.00	B3	Brown sandy slightly gravelly CLAY.	MC
BH SBC020	0.50	J4	Brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC020	1.00	J6	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC020	1.20	B9	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC020	2.50	J12	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC020	2.50	B13	Brown slightly sandy slightly gravelly CLAY.	MCV SB
BH SBC020	4.00	J16	Grey with orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC020	4.00	B17	Brown slightly sandy gravelly CLAY.	Density PSD SED PD IS for CP4 and MCV
BH SBC020	6.00	J20	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC020	6.00	B21	Brown slightly sandy slightly gravelly CLAY.	MCV CBR
BH SBC021	0.05	J1	Light brown slightly sandy slightly gravelly CLAY.	MC

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Page 6 of 21

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC021	0.05 B2	Brown clayey sandy gravelly SILT.	PD CP4 MCV
BH SBC021	0.35 B5	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC021	1.20 B9	Brown slightly sandy slightly gravelly CLAY with a low cobble content.	MCV
BH SBC021	1.90 J10	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC021	2.00 J11	Grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC021	2.00 B12	Brown slightly sandy slightly gravelly CLAY.	Density PD CBR IS for CP4 and MCV
BH SBC021	3.00 J14	Grey slightly sandy gravelly CLAY of low plasticity.	MC PI
BH SBC021	3.20 U15	Firm grey slightly sandy gravelly CLAY.	HSV MCUT
BH SBC021	4.80 B20	Grey brown slightly sandy slightly gravelly CLAY.	MCV
BH SBC021	5.70 J22	Grey brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC021	6.30 U23	Medium strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC022	1.50 J5	Grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC022	3.50 B13	Grey slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC022	4.20 J14	Light brown grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC022	4.50 U15	Medium strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC023A	1.20 U9	High strength brown slightly sandy slightly gravelly CLAY.	HSV MUUT
BH SBC023A	1.70 J10	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC023A	2.20 B13	Brown slightly sandy slightly gravelly CLAY.	MCV SB
BH SBC023A	3.00 J14	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC023A	3.70 B16	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC023A	4.80 J18	Dark grey slightly sandy slightly gravelly CLAY.	BRE

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	Date of issue :- 07/09/2021	Certificate No. :- SD/4322A/7	AEG Contract No. :- 4322A
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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC023A	5.40 B20	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC023A	6.50 J21	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC023A	7.20 B22	Dark grey slightly sandy slightly gravelly CLAY.	IS for MCV
BH SBC023A	8.00 B23	Brown clayey slightly sandy GRAVEL and COBBLES.	PSD SED
BH SBC023A	9.25 J24	Dark grey silty slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC023A	10.70 B28	Brown slightly sandy slightly gravelly CLAY.	BRE
BH SBC023A	12.40 U31	Very high strength brown slightly sandy slightly gravelly CLAY.	UUT OED
BH SBC023A	15.00 J36	Grey slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC023A	16.20 J38	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC024	0.60 B2	Brown with orange mottling slightly sandy slightly gravelly CLAY with some organic matter.	MCV
BH SBC024	0.80 J3	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MC
BH SBC024	1.50 U5	Firm dark grey slightly sandy gravelly CLAY.	HSV MCUT
BH SBC024	2.00 J6	Grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC024	2.50 J9	Brown slightly sandy slightly gravelly CLAY.	BRE
BH SBC024	2.50 B10	Brown with grey mottling slightly sandy slightly gravelly CLAY.	MCV
BH SBC024	3.20 J11	Grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC024	3.50 U12	Low strength brown slightly sandy slightly gravelly CLAY.	HSV MUUT
BH SBC024	4.00 J13	Dark grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC024	4.40 B15	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC024	4.50 B17	Brown clayey slightly sandy slightly gravelly SILT.	Density PSD SED CP4 MCV
BH SBC024	5.50 B20	Brown slightly sandy slightly gravelly CLAY.	MCV SB IS for CBR

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Page 8 of 21

Date of issue :-

07/09/2021

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC024	6.20	J21	Grey very clayey sandy GRAVEL.	MC PI (IS for LL)
BH SBC024	22.00	C38	Very high strength brown sandy gravelly CLAY.	MUUT
BH SBC025	0.02	J1	Orange brown sandy CLAY of high plasticity with rootlets.	MC PI
BH SBC025	0.60	J9	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC025	2.30	J14	Grey brown slightly sandy slightly gravelly CLAY with some sand pockets.	MC
BH SBC025	2.30	B15	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC025	3.30	U17	Stiff grey dark brown slightly sandy slightly gravelly CLAY.	OED US for CUT
BH SBC025	6.70	J26	Brown with grey mottling slightly sandy slightly gravelly CLAY of low to intermediate plasticity.	MC PI
BH SBC025	17.00	C38	Extremely high strength brown sandy gravelly CLAY.	MUUT
BH SBC026	0.05	J1	Brown slightly sandy slightly gravelly CLAY with occasional rootlets (Topsoil).	MC
BH SBC026	0.50	B4	Brown grey sandy slightly gravelly CLAY with occasional rootlets.	MCV
BH SBC026	1.20	U7	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC026	1.55	J8	Brown grey with orange mottling slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC026	2.00	J9	Grey slightly sandy slightly gravelly CLAY.	BRE
BH SBC026	2.30	B12	Brown silty sandy gravelly CLAY.	Density PD CP4 MCV
BH SBC026	2.85	B13	Grey very clayey very sandy GRAVEL.	PSD SED
BH SBC026	3.40	J14	Dark grey slightly sandy slightly gravelly CLAY with sand pockets.	BRE
BH SBC026	3.40	B15	Brown slightly sandy slightly gravelly CLAY.	CBR MCV
BH SBC026	4.10	J17	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC026	4.30	U18	Very high strength brown sandy gravelly CLAY.	HSV US for UUT
BH SBC026	6.10	J22	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI

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Date of issue :- 07/09/2021		Certificate No :- SD/4322A/9	AEG Contract No. :- 4322A	



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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
BH SBC026	6.10 B23	Dark grey slightly sandy slightly gravelly CLAY.	MCV
BH SBC027	0.05 J1	Light brown SILT of high to very high plasticity with many rootlets.	MC PI
BH SBC027	0.05 B2	Brown clayey sandy gravelly SILT.	PD CP4 MCV
BH SBC027	0.50 J6	Brown with grey and orange mottling sandy CLAY of intermediate plasticity.	MC PI
BH SBC027	0.50 B7	Brown sandy slightly gravelly CLAY.	PSD SED
BH SBC027	1.80 J11	Grey slightly sandy slightly gravelly CLAY of low plasticity with some sand pockets.	MC PI
BH SBC027	2.00 U12	Stiff dark grey slightly sandy gravelly CLAY.	HSV MCUT
BH SBC027	3.20 J15	Dark grey slightly sandy slightly gravelly CLAY.	MC
BH SBC027	5.20 J21	Grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC028	0.90 B6	Brown with orange mottling very clayey very gravelly SAND.	PSD SED
BH SBC028	1.10 J7	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC028	3.50 U14	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC028	3.95 J15	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC028	5.50 U18	Firm dark brown slightly sandy gravelly CLAY.	HSV MCUT
BH SBC028	8.00 U23	High strength brown slightly sandy slightly gravelly CLAY.	HSV UUT
BH SBC029	0.20 J2	Brown sandy slightly gravelly CLAY of intermediate plasticity.	MC PI PSD SED
BH SBC029	1.00 J5	Brown with grey and orange mottling slightly sandy CLAY.	BRE
BH SBC029	1.20 J7	Light grey with orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC029	1.20 B8	Brow with grey veining slightly sandy slightly gravelly CLAY.	MCV
BH SBC029	2.50 J11	Brown slightly sandy gravelly CLAY.	MC PI (IS for LL)
BH SBC029	2.50 B12	Brown slightly sandy gravelly CLAY.	MCV

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	Site No. [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 10 of 21
Date of issue :- 07/09/2021	Certificate No. :- SD/4322A/10	AEG Contract No. :- 4322A	
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Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC030	0.70	J4	Orange brown grey mottled slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC030	1.00	J6	Light brown with orange mottling slightly sandy slightly gravelly CLAY.	BRE
BH SBC030	1.00	B7	Light brown with orange and grey mottling slightly sandy slightly gravelly CLAY.	MCV
BH SBC030	1.20	J8	Grey brown slightly sandy slightly gravelly CLAY with sand pockets.	BRE
BH SBC030	1.20	B9	Brown slightly sandy slightly gravelly CLAY.	MCV
BH SBC030	2.50	J12	Brown slightly sandy slightly gravelly CLAY of low plasticity with sand pockets.	MC PI
BH SBC030	5.50	B21	Brown sandy gravelly CLAY.	MC
BH SBC031	2.00	U9	Medium strength brown sandy gravelly CLAY.	HSV UUT
BH SBC031	3.00	J12	Brown CLAY of low plasticity.	MC PI
BH SBC031	4.00	U14	Firm fissured brown slightly sandy slightly gravelly CLAY/SILT.	HSV MCUT
BH SBC031	5.00	B17	Brown very clayey sandy GRAVEL.	PSD SED
BH SBC031	6.00	J18	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC031	6.50	U19	High strength brown slightly sandy slightly gravelly CLAY.	UUT OED
BH SBC031	9.00	J24	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC031	9.50	U25	Very stiff dark brown slightly sandy slightly gravelly CLAY.	HSV MCUT
BH SBC031	12.00	J30	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC031	12.50	U31	High strength brown sandy slightly gravelly CLAY.	HSV UUT
BH SBC032	1.00	B6	Brown slightly sandy slightly gravelly CLAY.	PSD SED
BH SBC032	1.20	J7	Brown slightly sandy slightly gravelly CLAY.	MC PI(IS for LL)
BH SBC032	2.00	U9	High strength brown slightly sandy slightly gravelly CLAY.	UUT OED
BH SBC032	3.00	J12	Dark grey slightly sandy slightly gravelly CLAY.	MC

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
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	Site No. :- [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 11 of 21	
Date of issue :- 07/09/2021	Certificate No. :- SD/4322A/11	AEG Contract No. :- 4322A		

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
BH SBC032A	5.00	U3	Firm and stiff brown slightly sandy slightly gravelly CLAY.	HSV MCUT
BH SBC032A	5.45	J4	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
BH SBC032A	8.00	U9	High strength brown sandy slightly gravelly CLAY.	HSV UUT
BH SBC032A	8.45	J10	Dark grey slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
BH SBC032A	9.50	B13	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC001	0.10	J1	Light brown slightly sandy slightly gravelly CLAY.	MC
TP SBC001	1.00	B4	Brown very clayey sandy GRAVEL.	PSD SED PD CP4 IS for MCV
TP SBC001	1.50	J6	Brown slightly sandy gravelly CLAY of low plasticity.	MC PI
TP SBC002	0.30	J3	Brown sandy gravelly CLAY of low to intermediate plasticity.	MC PI
TP SBC002	0.50	B4	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC002	1.30	J6	Light brown slightly sandy slightly gravelly CLAY.	BRE
TP SBC002	1.50	B7	Brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC002	2.30	J8	Light brown slightly sandy gravelly CLAY.	MC
TP SBC003	0.35	J3	Light brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC003	0.50	B4	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC003	0.90	J5	Light grey with orange mottling sandy CLAY.	BRE
TP SBC003	1.50	B7	Light brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC003	1.90	J8	Light brown with grey mottling sandy slightly gravelly CLAY.	MC
TP SBC003	2.50	B10	Brown with grey mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC003	2.90	J11	Grey with orange mottling sandy slightly gravelly CLAY.	BRE
TP SBC004	0.50	B3	Brown with grey and orange mottling sandy slightly gravelly CLAY.	MC PSD SED

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Site: [REDACTED]

Name :-

M. SELKIRK

Page 12 of 21

Date of issue :-

07/09/2021

Certificate No :-

SD/4322A/12

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
TP SBC004	0.60	J4	Brown sandy CLAY.	MC
TP SBC004	1.60	J8	Brown with grey mottling sandy CLAY of intermediate plasticity.	MC PI
TP SBC005	0.50	J3	Light brown with orange mottling slightly sandy gravelly CLAY.	MC
TP SBC005	1.00	B4	Orange brown with grey mottling slightly sandy slightly gravelly CLAY.	PSD SED PD CBR IS for MCV and CP4
TP SBC005	3.00	B10	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC005	3.50	J11	Light brown sandy gravelly CLAY of low plasticity.	MC PI
TP SBC006	0.40	J2	Light brown with orange mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC006	1.50	J8	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MC
TP SBC006	2.90	J13	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC006	4.30	B16	Dark grey silty slightly sandy slightly gravelly CLAY with a medium cobble content.	PSD SED
TP SBC007	0.10	J1	Brown sandy CLAY.	MC
TP SBC007	0.40	J3	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC007	0.40	B4	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC008	0.50	J3	Brown with grey mottling sandy CLAY of intermediate plasticity.	MC PI
TP SBC008	1.60	J7	Brown sandy gravelly CLAY.	MC
TP SBC008	3.00	B10	Dark grey slightly sandy slightly gravelly CLAY of weathered mudstone.	PSD SED
TP SBC008	4.00	B12	Dark grey clayey very sandy GRAVEL of weathered mudstone.	PSD SED
TP SBC009	0.40	J4	Brown slightly clayey SAND.	MC
TP SBC009	0.40	B5	Light brown very clayey/silty gravelly SAND with rootlets.	PSD SED
TP SBC009	1.60	J9	Brown with orange and grey mottling sandy CLAY of low plasticity.	MC PI
TP SBC009	2.20	J12	Dark grey slightly sandy slightly gravelly CLAY.	MC

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	Site Name :- [REDACTED]	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold; font-size: 1.2em;">M. SELKIRK</span>	Page 13 of 21
Date of issue :- 07/09/2021	Certificate No :- SD/4322A/13	AEG Contract No. :- 4322A	
			 1367

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC009	2.80 B13	Grey brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC010	0.50 J3	Light brown with orange mottling slightly sandy gravelly CLAY.	MC
TP SBC010	0.60 B4	Light brown with grey and orange mottling very clayey very gravelly SAND.	PSD SED
TP SBC010	1.00 B6	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC010	1.50 J7	Light brown with orange mottling slightly sandy slightly gravelly CLAY.	MC BRE
TP SBC010	2.00 B8	Dark brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC010	3.00 B11	Dark grey slightly sandy slightly gravelly CLAY.	MCV
TP SBC011	0.40 B4	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC011	1.10 J5	Light brown with grey and orange mottling slightly sandy CLAY.	MC
TP SBC011	1.20 B7	Light brown with grey veining slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC011	2.00 B9	Dark brown slightly sandy slightly gravelly CLAY.	PD CP4 MCV
TP SBC011	2.40 J10	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC011	2.80 B11	Brown slightly sandy slightly gravelly CLAY.	Density PSD SED CBR
TP SBC012A	1.00 J1	Light brown sandy slightly gravelly CLAY.	BRE
TP SBC012A	1.00 B2	Brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC012A	2.00 B6	Brown with orange and grey mottling slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC012A	2.90 J9	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC012A	3.00 B10	Grey slightly sandy slightly gravelly CLAY.	MCV
TP SBC012A	3.50 J12	Dark grey slightly sandy slightly gravelly CLAY.	MC
TP SBC012A	4.00 B13	Brown slightly sandy slightly gravelly CLAY.	Density CPV MCV SB
TP SBC013	1.00 B4	Light brown with orange and grey mottling slightly sandy slightly gravelly CLAY.	PSD SED

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	<b>S</b> [Redacted]	Name :- <b>M. SELKIRK</b>	Page 14 of 21	
	Date of issue :- 20/07/2021	Certificate No :- SD/4322A/14	AEG Contract No. :- 4322A	UKAS TESTING 1367





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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC013	1.50 J6	Brown sandy gravelly CLAY.	MC
TP SBC013	2.00 B7	Brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC013	3.00 B10	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI PSD SED CBR
TP SBC013	3.50 J11	Dark grey slightly sandy slightly gravelly CLAY.	BRE
TP SBC013	4.00 B12	Dark grey with orange mottling slightly sandy slightly gravelly CLAY.	Density PD CP4 MCV
TP SBC013	4.50 J14	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC014	0.30 J2	Brown sandy slightly gravelly CLAY with rootlets (Topsoil).	MC
TP SBC014	0.40 B4	Light brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI PSD SED
TP SBC014	0.80 B6	Light brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC014	1.60 B9	Light brown very clayey sandy GRAVEL.	PSD SED PD CP4 US for MCV & SB
TP SBC014	2.00 J10	Light brown slightly sandy slightly gravelly CLAY.	BRE
TP SBC014	2.00 B11	Light brown sandy gravelly CLAY with a low cobble content.	MCV
TP SBC014	2.50 J13	Dark grey slightly sandy slightly gravelly CLAY with sand dustings.	MC
TP SBC014	2.80 B14	Brown slightly sandy slightly gravelly CLAY.	Density PD CP4 CBR MCV
TP SBC015	0.50 J3	Friable brown sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC015	1.00 B4	Light brown very clayey very sandy GRAVEL.	PSD SED
TP SBC015	1.50 J6	Brown sandy gravelly CLAY.	MC
TP SBC016	1.50 J6	Dark grey brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC016	2.00 B7	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC016	3.50 J11	Dark brown slightly sandy slightly gravelly CLAY.	MC
TP SBC017	0.40 J2	Light brown with orange and grey mottling sandy slightly gravelly CLAY.	MC

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	S [Redacted]	Name :- <b>M. SELKIRK</b>	Page 15 of 21	
Date of issue :- 20/07/2021		Certificate No :- SD/4322A/15	AEG Contract No. :- 4322A	




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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC017	1.20 B9	Dark grey slightly sandy slightly gravelly CLAY.	MCV
TP SBC017	2.00 B10	Brown slightly sandy slightly gravelly CLAY.	PD CP4 MCV
TP SBC017	2.50 J12	Dark grey with orange mottling slightly sandy slightly gravelly CLAY.	BRE
TP SBC017	3.00 B13	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC017	4.30 J18	Dark grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC018	0.40 J4	Light brown with orange mottling sandy CLAY.	MC
TP SBC018	1.00 B6	Grey slightly sandy slightly gravelly CLAY.	PSD SED CBR
TP SBC018	1.80 J8	Grey and brown mottled sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC018	2.00 B9	Dark grey sandy gravelly CLAY.	PD CP4 MCV
TP SBC019	0.20 J1	Brown sandy CLAY.	MC
TP SBC019	0.30 J2	Brown sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC019	0.40 B4	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC020	0.70 J6	Grey brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC020	2.00 B10	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC020	3.00 B13	Brown slightly sandy slightly gravelly CLAY.	MC
TP SBC021	1.00 B6	Brown slightly sandy slightly gravelly CLAY.	PD CP4 MCV
TP SBC021	1.50 J8	Brown sandy gravelly CLAY of low plasticity.	MC PI
TP SBC021	2.00 B9	Dark brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC021	3.00 B13	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC021	3.50 J14	Dark grey slightly sandy slightly gravelly CLAY.	MC
TP SBC022	0.50 J3	Orange brown sandy CLAY.	MC

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	S 	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold; color: red;">M. SELKIRK</span>	Page 16 of 21	
Date of issue :- 20/07/2021		Certificate No :- SD/4322A/16	AEG Contract No. :- 4322A	




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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC022	2.00 B7	Brown slightly sandy gravelly CLAY.	CBR
TP SBC022	3.00 B10	Brown slightly sandy slightly gravelly CLAY.	PD CP4 MCV
TP SBC022	3.50 J11	Brown sandy gravelly CLAY of low plasticity.	MC PI
TP SBC022	4.00 B12	Grey slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC023	0.40 J3	Light brown slightly clayey slightly gravelly SAND.	MC
TP SBC023	1.50 J6	Brown clayey/silty sandy GRAVEL. (Clay/silt of low plasticity).	MC PI
TP SBC023	2.00 B7	Brown clayey sandy GRAVEL with a medium cobble content.	PSD SED
TP SBC024	0.50 J3	Light brown with orange and grey mottling sandy gravelly CLAY of intermediate plasticity.	MC PI
TP SBC024	1.00 B4	Brown slightly sandy slightly gravelly CLAY.	PSD SED PD CBR IS for CP4 and MCV
TP SBC024	1.50 J6	Dark brown with grey and orange mottling slightly sandy gravelly CLAY.	MC
TP SBC024	2.00 B7	Brown slightly sandy slightly gravelly CLAY.	PSD SED PD CBR IS for CP4 and MCV
TP SBC024	3.00 B11	Brown clayey sandy GRAVEL.	PSD SED
TP SBC025	0.15 J1	Light brown slightly sandy CLAY/SILT of high plasticity with rootlets.	MC PI
TP SBC025	2.00 B8	Dark grey slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC025	3.50 J12	Dark grey sandy gravelly CLAY.	MC
TP SBC026	0.50 J3	Light brown sandy slightly gravelly CLAY of low to intermediate plasticity.	MC PI
TP SBC026	1.00 B5	Brown slightly sandy slightly gravelly CLAY.	PSD SED PD CPV CBR MCV
TP SBC026	1.90 J7	Brown slightly sandy slightly gravelly CLAY.	MC PSD SED
TP SBC027	1.00 B4	Brown sandy gravelly CLAY.	MCV
TP SBC027	1.50 J6	Grey slightly sandy slightly gravelly CLAY.	MC
TP SBC027	2.00 B8	Brown slightly sandy slightly gravelly CLAY.	MCV

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
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	Site No :- [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 17 of 21	
	Date of issue :- 20/07/2021	Certificate No :- SD/4322A/17	AEG Contract No. :- 4322A	

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC027	2.50 J9	Dark grey sandy slightly gravelly CLAY.	BRE
TP SBC027	3.00 B11	Dark grey slightly sandy slightly gravelly CLAY.	Density PSD SED PD CP4 MCV
TP SBC027	3.50 J12	Dark grey brown sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC027	4.00 B14	Brown slightly sandy gravelly CLAY.	PSD SED
TP SBC028	0.70 J5	Grey brown mottled slightly sandy slightly gravelly CLAY.	BRE
TP SBC028	1.00 B6	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC028	2.00 B9	Dark grey slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC028	2.70 J11	Light brown sandy gravelly CLAY.	MC
TP SBC028	3.00 J12	Dark grey with orange mottling slightly sandy slightly gravelly CLAY.	BRE
TP SBC028	3.00 B13	Friable grey slightly sandy slightly gravelly CLAY.	MCV
TP SBC028	4.00 B16	Dark grey slightly sandy slightly gravelly CLAY.	Density PSD SED
TP SBC028	4.50 J18	Dark grey sandy gravelly CLAY of low plasticity.	MC PI
TP SBC028	4.80 B19	Brown slightly sandy slightly gravelly CLAY.	PD CP4 CBR MCV SB
TP SBC029	0.30 B2	Brown wth grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC029	0.30 J2	Light brown with orange and grey mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC029	2.00 B8	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC029	2.50 J10	Dark grey with orange mottling slightly sandy slightly gravelly CLAY.	MC
TP SBC030	1.50 J8	Brown slightly sandy slightly gravelly CLAY.	MC
TP SBC030	2.00 B10	Brown silty sandy gravelly CLAY.	PD CP4 MCV
TP SBC030	2.50 J12	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC030	3.00 B13	Brown slightly sandy slightly gravelly CLAY.	PSD SED

Contract Title :- **A66 North Trans Pennine Scheme C Section 9**

Client :- **AMEY OW Limited**



Site Name :- [Redacted]

Name :- **M. SELKIRK**

Page 18 of 21

Date of issue :- **20/07/2021**

Certificate No :- **SD/4322A/18**

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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC031	0.10 J1	Light brown slightly sandy CLAY/SILT of high plasticity with rootlets.	MC PI
TP SBC031	0.80 B6	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED PD CP4 MCV
TP SBC031	1.90 J8	Light brown slightly sandy slightly gravelly CLAY.	MC
TP SBC031	2.00 B9	Dark brown slightly sandy slightly gravelly CLAY.	MCV
TP SBC031	2.80 J12	Dark grey slightly sandy slightly gravelly CLAY.	BRE
TP SBC031	3.00 B13	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC032	0.20 B3	Brown sandy slightly gravelly CLAY.	PSD SED
TP SBC032	0.50 J4	Light brown sandy CLAY.	MC
TP SBC032	1.00 J6	Brown with orange mottling slightly sandy slightly gravelly CLAY.	BRE
TP SBC032	1.00 B7	Brown with orange mottling slightly sandy slightly gravelly CLAY.	PD CP4 MCV
TP SBC032	1.50 J9	Brown with orange mottling sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC032	2.00 B11	Grey brown slightly sandy gravelly CLAY.	PSD SED
TP SBC033	0.80 J5	Brown with grey mottling sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC033	1.00 B6	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC033	2.50 J11	Dark grey sandy gravelly CLAY.	MC
TP SBC034	0.50 J3	Brown sandy gravelly CLAY of intermediate plasticity.	MC PI
TP SBC034	0.70 B4	Brown sandy slightly gravelly CLAY.	PSD SED
TP SBC034	1.50 J7	Grey sandy gravelly CLAY.	MC
TP SBC035	0.20 J1	Brwn slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC035	1.50 J8	Brown slightly sandy slightly gravelly CLAY.	MC
TP SBC035	1.80 B9	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	PSD SED

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
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	Site Name :- <span style="background-color: black; color: black;">[REDACTED]</span>	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold; font-size: 1.2em;">M. SELKIRK</span>	Page 19 of 21
Date of issue :- 20/07/2021	Certificate No :- SD/4322A/19	AEG Contract No. :- 4322A	
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## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
TP SBC035	3.00 J13	Brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC036	0.50 J3	Light brown with orange mottling slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC036	1.50 J6	Light brown slightly sandy slightly gravelly CLAY.	MC
TP SBC036	3.50 J11	Dark grey silty sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC038	0.50 J3	Light brown sandy CLAY of intermediate plasticity.	MC PI
TP SBC038	1.00 B5	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC038	1.50 J6	Brown slightly sandy slightly gravelly CLAY.	MC
TP SBC039	0.50 J3	Brown with orange mottling slightly sandy slightly gravelly CLAY.	MC
TP SBC039	1.00 B4	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC039	1.50 J6	Brown grey slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC039	2.00 B7	Brown with grey mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC039	2.50 J9	Dark brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI
TP SBC040	0.10 J1	Brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC040	0.80 B4	Brown slightly sandy slightly gravelly CLAY.	PSD SED
TP SBC040	1.40 J6	Brown slightly sandy slightly gravelly CLAY.	MC
TP SBC041	0.50 J3	Light brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC041A	1.00 B1	Brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	MCV
TP SBC041A	1.50 J3	Light brown with grey and orange mottling slightly sandy slightly gravelly CLAY.	BRE
TP SBC041A	2.00 B4	Brown very clayey very sandy GRAVEL and COBBLES.	PSD SED
TP SBC041A	2.50 J6	Light brown with orange mottling slightly sandy slightly gravelly CLAY.	MC
TP SBC041A	3.00 B7	Grey with orange mottling sandy slightly gravelly CLAY.	MCV

Contract Title :- **A66 North Trans Pennine Scheme C Section 9**

Client :- **AMEY OW Limited**



Site: [Redacted]  
Date of issue :-  
20/07/2021

Name :- **M. SELKIRK**  
Certificate No :-  
SD/4322A/20

Page 20 of 21  
AEG Contract No. :-  
4322A







# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - 3

## LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m)	ID	Description	Laboratory Tests/Remarks
TP SBC041A	3.00	J8	Grey with orange mottling sandy slightly gravelly CLAY.	BRE
TP SBC042	0.30	J2	Light brown slightly sandy slightly gravelly CLAY of intermediate plasticity.	MC PI
TP SBC044	0.80	J4	Dark grey clayey sandy slightly gravelly SILT of low plasticity.	MC PI
TP SBC044	1.50	B6	Brown sandy slightly gravelly CLAY.	PSD SED

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Site Name :- [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 21 of 21	
Date of issue :- 20/07/2021	Certificate No :- SD/4322A/21	AEG Contract No. :- 4322A		

## Moisture Content/Plasticity Index and Moisture Content





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL


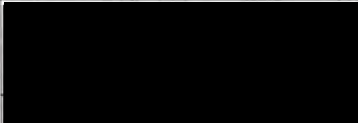

## MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
BH SBC002	1.50	J5	1.50	32	04/05/2021	
BH SBC006	1.00	J5	1.00	19	13/05/2021	
BH SBC007	0.20	J2	0.20	25	13/05/2021	
BH SBC009	2.00	B10	2.00	32	06/05/2021	
BH SBC010	0.05	J1	0.05	53	13/04/2021	
BH SBC012	4.00	J21	4.00	19	10/05/2021	
BH SBC013	7.00	J24	7.00	12	04/05/2021	
BH SBC015	11.50	J32	11.50	15	10/05/2021	
BH SBC020	0.00	B3	0.00	29	19/04/2021	
BH SBC021	0.05	J1	0.05	35	04/05/2021	
BH SBC024	0.80	J3	0.80	25	04/05/2021	
BH SBC025	2.30	J14	2.30	11	10/05/2021	
BH SBC026	0.05	J1	0.05	32	04/05/2021	
BH SBC027	3.20	J15	3.20	11	04/05/2021	
BH SBC030	5.50	B21	5.50	10	19/05/2021	
BH SBC032	3.00	J12	3.00	11	04/05/2021	
TP SBC001	0.10	J1	0.10	20	10/05/2021	
TP SBC002	2.30	J8	2.30	18	08/04/2021	
TP SBC003	1.90	J8	1.90	17	13/04/2021	
TP SBC004	0.60	J4	0.60	23	04/05/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	 Name : <b>M. SELKIRK</b>	Page 1 of 3	
24/05/2021	Certificate No :- MC/4322A/1	AEG Contract No. :- <b>4322A</b>	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL


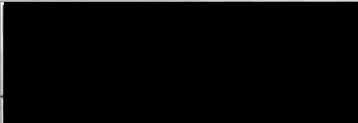

## MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
TP SBC005	0.50	J3	0.50	23	08/04/2021	
TP SBC006	1.50	J8	1.50	23	14/04/2021	
TP SBC007	0.10	J1	0.10	40	14/04/2021	
TP SBC008	1.60	J7	1.60	13	13/04/2021	
TP SBC009	0.40	J4	0.40	21	13/04/2021	
TP SBC009	2.20	J12	2.20	19	07/05/2021	
TP SBC010	0.50	J3	0.50	21	08/04/2021	
TP SBC010	1.50	J7	1.50	14	07/05/2021	
TP SBC011	1.10	J5	1.10	28	14/04/2021	
TP SBC012A	3.50	J12	3.50	14	07/05/2021	
TP SBC013	1.50	J6	1.50	17	13/05/2021	
TP SBC014	0.30	J2	0.30	25	04/05/2021	
TP SBC014	2.50	J13	2.50	19	08/04/2021	
TP SBC015	1.50	J6	1.50	24	13/05/2021	
TP SBC016	3.50	J11	3.50	13	10/05/2021	
TP SBC017	0.40	J2	0.40	18	10/05/2021	
TP SBC018	0.40	J4	0.40	26	08/04/2021	
TP SBC019	0.20	J1	0.20	49	13/05/2021	
TP SBC020	3.00	B13	3.00	22	05/05/2021	
TP SBC021	3.50	J14	3.50	16	10/05/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	 Name :- <span style="color: red; font-weight: bold; font-size: 1.2em;">M. SELKIRK</span>	Page 2 of 3	
24/05/2021	Certificate No :- MC/4322A/2	AEG Contract No. :- <b>4322A</b>	1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL



## MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
TP SBC022	0.50	J3	0.50	19	12/05/2021	
TP SBC023	0.40	J3	0.40	17	30/04/2021	
TP SBC024	1.50	J6	1.50	19	08/04/2021	
TP SBC025	3.50	J12	3.50	12	08/04/2021	
TP SBC026	1.90	J7	1.90	17	09/04/2021	
TP SBC027	1.50	J6	1.50	17	08/04/2021	
TP SBC028	2.70	J11	2.70	16	08/04/2021	
TP SBC029	2.50	J10	2.50	14	08/04/2021	
TP SBC030	1.50	J8	1.50	17	22/04/2021	
TP SBC031	1.90	J8	1.90	16	08/04/2021	
TP SBC032	0.50	J4	0.50	19	09/04/2021	
TP SBC033	2.50	J11	2.50	12	13/04/2021	
TP SBC034	1.50	J7	1.50	14	13/04/2021	
TP SBC035	1.50	J8	1.50	16	22/04/2021	
TP SBC036	1.50	J6	1.50	14	10/05/2021	
TP SBC038	1.50	J6	1.50	15	10/05/2021	
TP SBC039	0.50	J3	0.50	32	22/04/2021	
TP SBC040	1.40	J6	1.40	16	28/04/2021	
TP SBC041A	2.50	J6	2.50	27	10/05/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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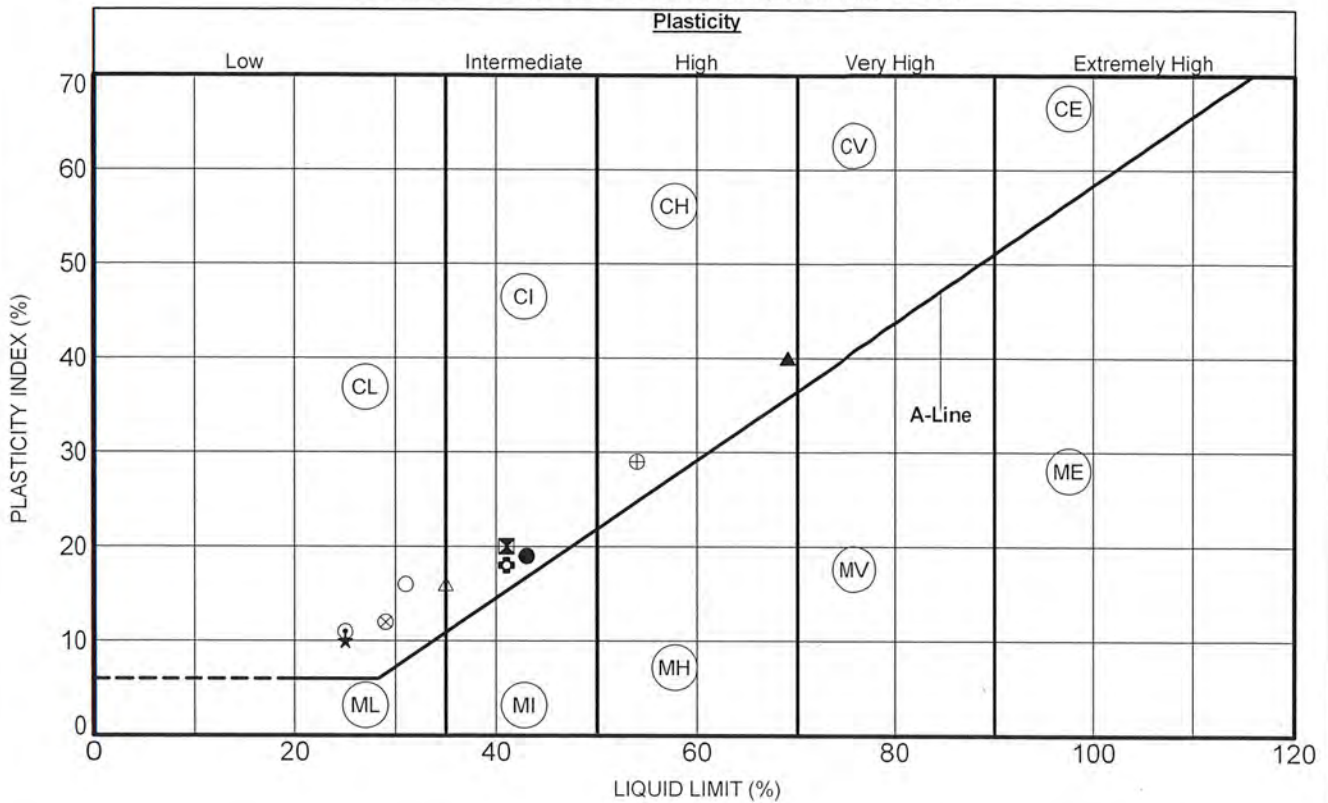
	24/05/2021	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold; color: red;">M. SELKIRK</span> Certificate No :- MC/4322A/3	Page 3 of 3  AEG Contract No. :- <span style="font-weight: bold; font-size: 1.2em;">4322A</span>	 1367
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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BQ

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC001	0.20	J2	0.20	43	24	19	0.00	Natural		24	13/05/2021
⊗BH SBC001	0.50	J4	0.50	41	21	20	0.10	Natural		23	13/05/2021
▲BH SBC002	0.80	J3	0.80	69	29	40	0.20	Natural		37	04/05/2021
★BH SBC002	3.00	J9	3.00	25	15	10	0.30	Natural		18	04/05/2021
⊙BH SBC002	5.20	J14	5.20	25	14	11	0.91	Natural		24	04/05/2021
◆BH SBC005	0.20	J2	0.20	41	23	18	0.39	Natural		30	22/04/2021
○BH SBC005	1.20	J6	1.20	31	15	16	0.38	Natural		21	30/04/2021
△BH SBC006	2.50	J11	2.50	35	19	16	0.00	Natural		19	10/05/2021
⊗BH SBC006	4.50	J17	4.50	29	17	12	-0.75	Natural		8.0	13/05/2021
⊕BH SBC007	1.20	J7	1.20	54	25	29	0.24	Natural		32	22/04/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Name :- <b>M. SELKIRK</b>	Page 1 of 13	
	Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/1	

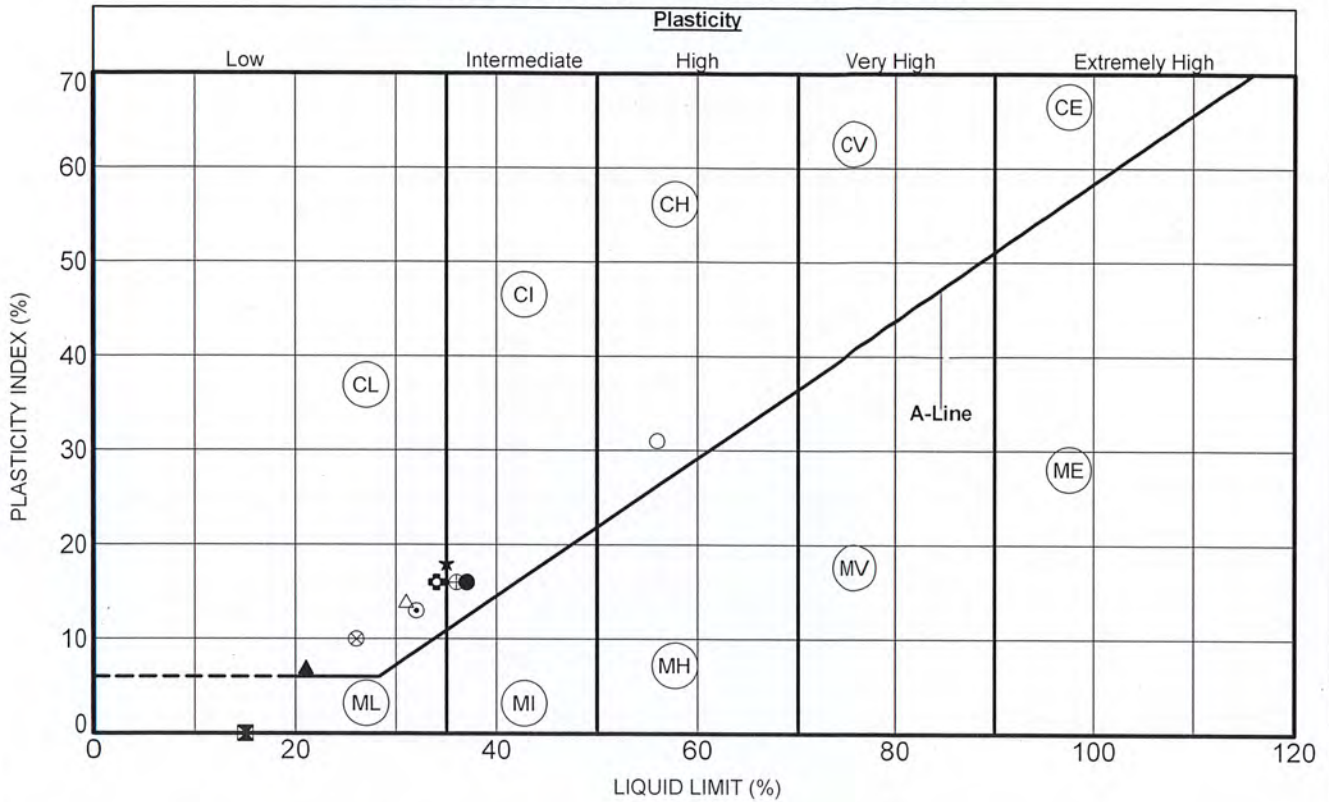


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BU

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT



Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC007	3.00	J13	3.00	37	21	16	-0.25	Natural		17	22/04/2021
⊗BH SBC008	1.20	J7	1.20		15			Natural		12	08/04/2021
▲BH SBC008	2.50	J11	2.50	21	14	7	-0.29	Natural		12	08/04/2021
★BH SBC009	0.20	J2	0.20	35	17	18	0.39	Natural		24	22/04/2021
⊙BH SBC009	1.00	J5	1.00	32	19	13	0.08	Natural		20	28/04/2021
◆BH SBC009	4.00	J14	4.00	34	18	16	-0.44	Natural		11	22/04/2021
○BH SBC010	0.25	J4	0.25	56	25	31	0.10	Natural		28	08/04/2021
△BH SBC010	2.30	J11	2.30	31	17	14	-0.14	Natural		15	13/04/2021
⊗BH SBC010A	3.70	J2	3.70	26	16	10	-0.10	Natural		15	28/04/2021
⊕BH SBC011	0.30	J5	0.30	36	20	16	0.00	Natural		20	10/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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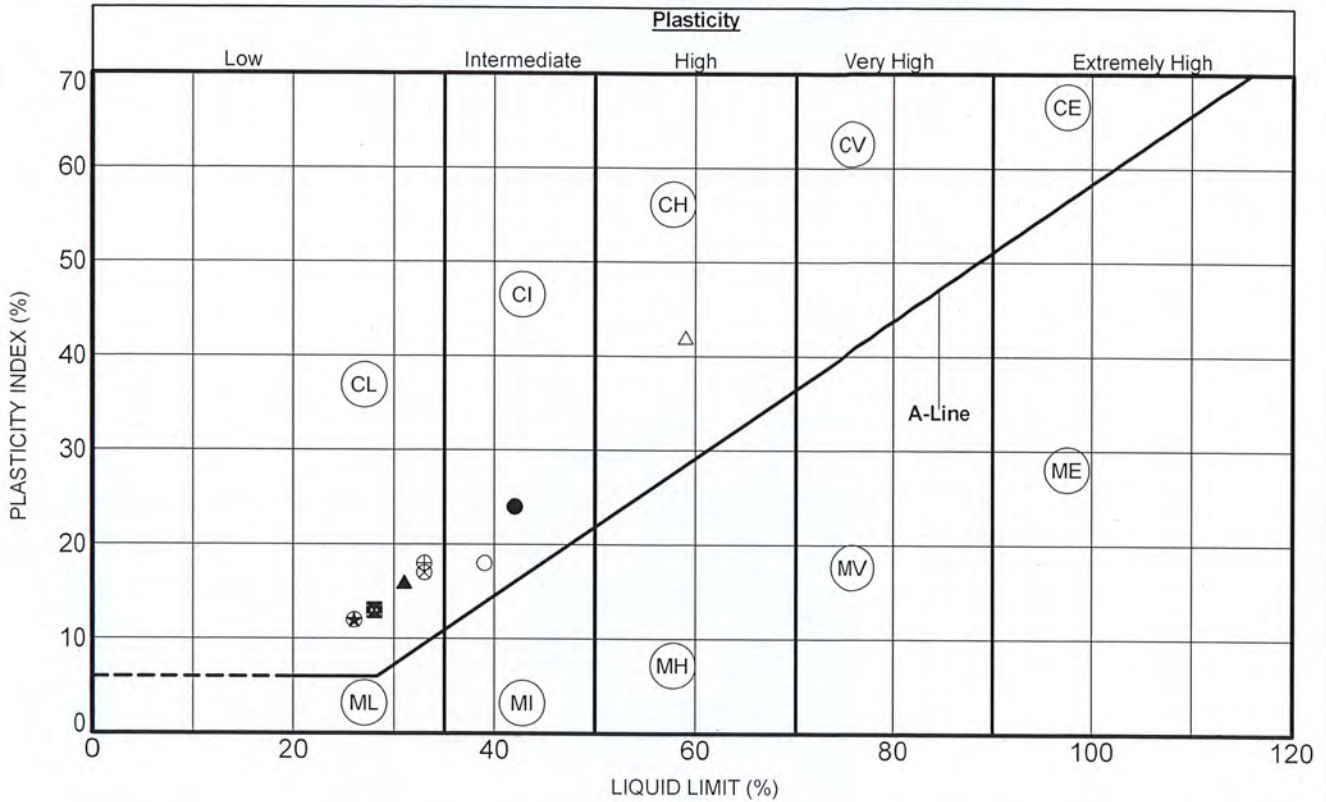
	Name :- <b>M. SELKIRK</b>	Page 2 of 13	
	Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/2	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990

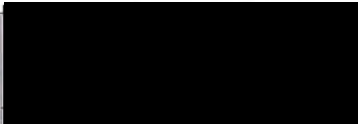


Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	L	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC011	5.10	J18	5.10	42	18	24	-0.04	Natural		17	10/05/2021
⊗BH SBC012	6.35	J28	6.35	28	15	13	0.00	Natural		15	12/05/2021
▲BH SBC012	7.60	J31	7.60	31	15	16	0.06	Natural		16	13/05/2021
★BH SBC013	2.50	J8	2.50	26	14	12	0.83	Natural		24	04/05/2021
⊙BH SBC013	5.20	J18	5.20	26	14	12	0.25	Natural		17	04/05/2021
◆BH SBC013	10.00	J31	10.00	28	15	13	0.38	Natural		20	17/05/2021
⊙BH SBC014A	0.70	J3	0.70	39	21	18	0.67	Natural		33	10/05/2021
△BH SBC014A	4.50	J14	4.50	59	17	42	0.29	Natural		29	13/05/2021
⊗BH SBC014A	7.00	J21	7.00	33	16	17	0.47	Natural		24	12/05/2021
⊕BH SBC015	13.70	J38	13.70	33	15	18	0.11	Natural		17	12/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Name :-

**M. SELKIRK**

Page 3 of 13

Date of Issue :- 03/09/2021

Certificate No :- PI/4322A/3

AEG Contract No. :- 4322A



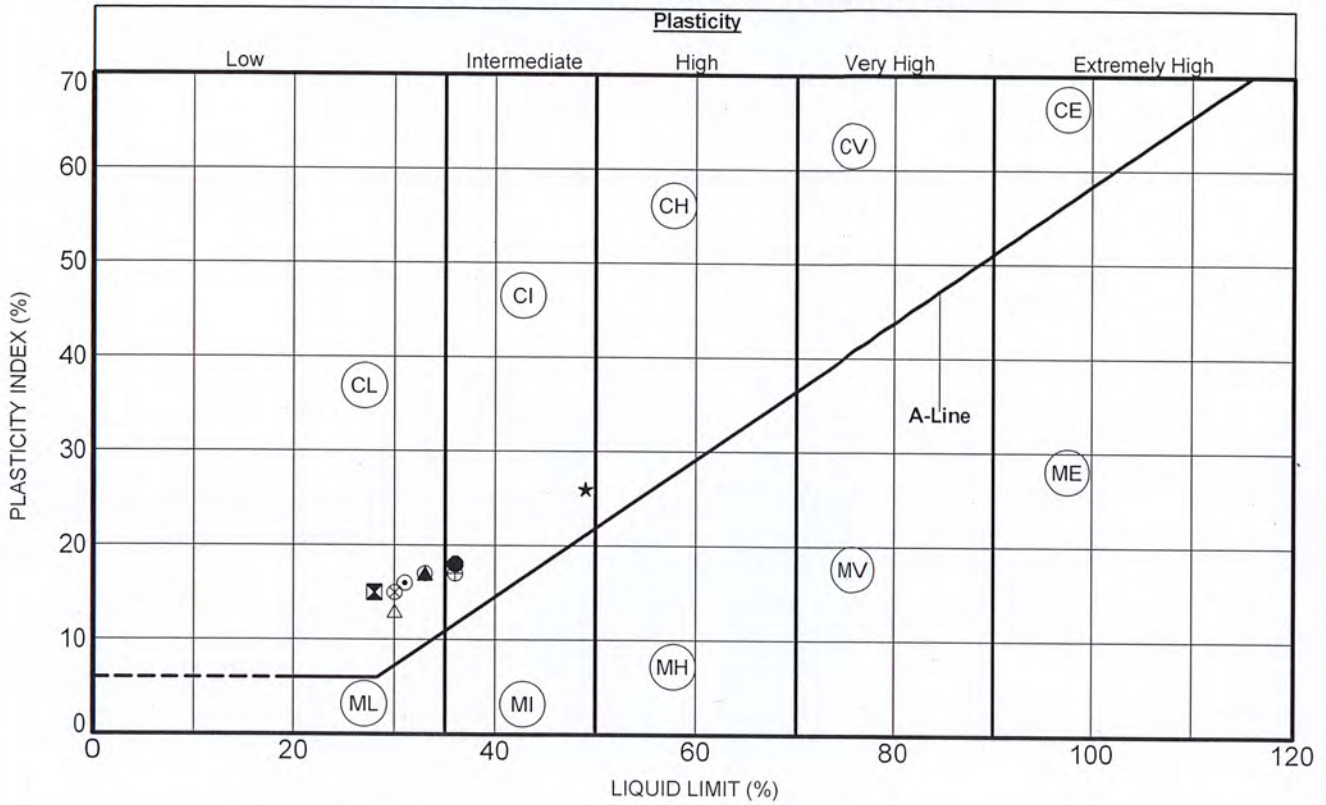


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pailton Fell, Chester-le-Street, Co. Durham, DH1 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BQ

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC015	16.00	J44	16.00	36	18	18	0.17	Natural		21	13/05/2021
⊗BH SBC016	0.70	J3	0.70	28	13	15	0.40	Natural		19	13/05/2021
▲BH SBC016	4.50	J12	4.50	33	16	17	-0.12	Natural		14	12/05/2021
★BH SBC017	0.70	J3	0.70	49	23	26	0.58	Natural		38	10/05/2021
⊙BH SBC017	3.50	J11	3.50	31	15	16	0.06	Natural		16	10/05/2021
◆BH SBC018	0.80	J3	0.80	36	18	18	0.06	Natural		19	10/05/2021
○BH SBC018	1.50	J5	1.50	33	16	17	0.00	Natural		16	13/05/2021
△BH SBC019	1.20	J7	1.20	30	17	13	0.00	Natural		17	30/04/2021
⊗BH SBC019	5.00	J16	5.00	30	15	15	0.33	Natural		20	10/05/2021
⊕BH SBC020	0.50	J4	0.50	36	19	17	0.24	Natural		23	10/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Name :-

M. SELKIRK

Page 4 of 13

Date of Issue :-

03/09/2021

Certificate No :-

PI/4322A/4

AEG Contract No. :-

4322A

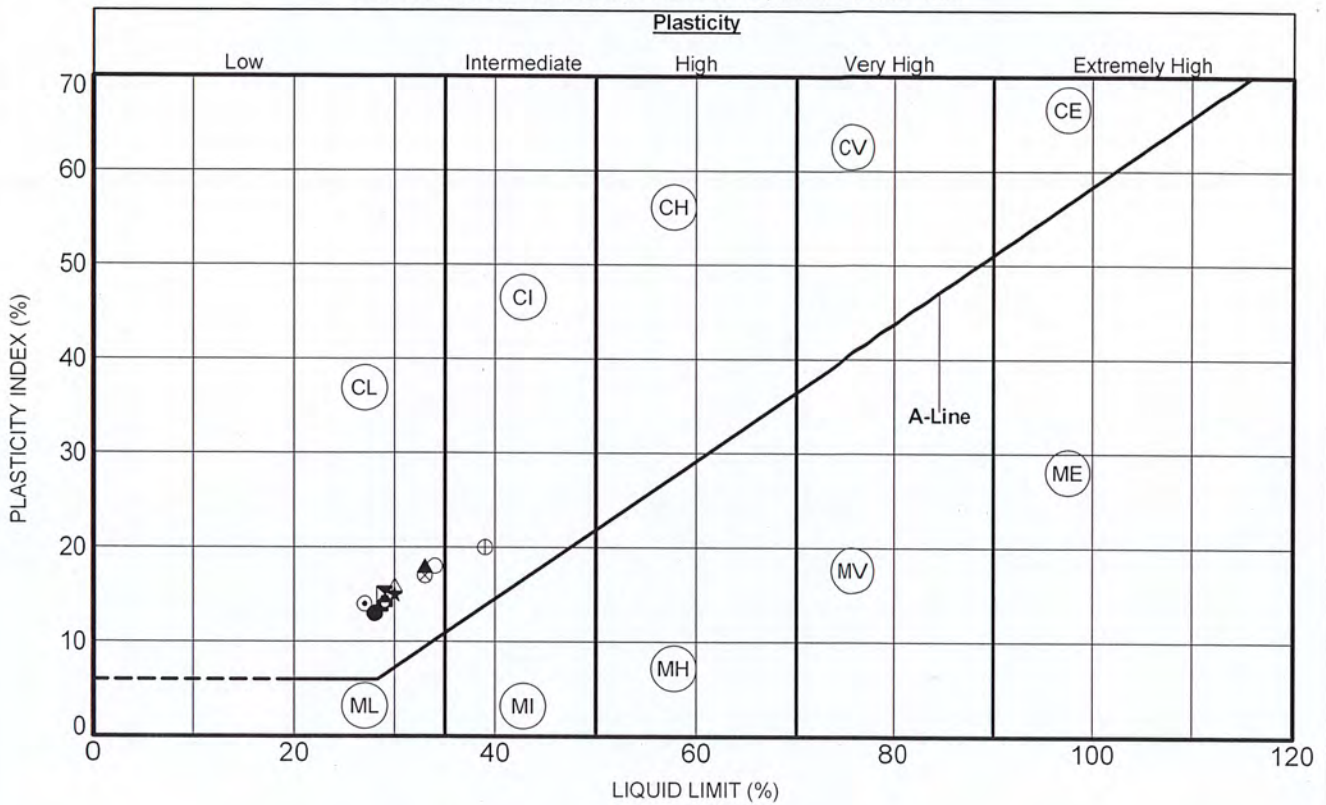


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BQ

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC020	2.50	J12	2.50	28	15	13	0.08	Natural		16	28/04/2021
⊗BH SBC020	6.00	J20	6.00	29	14	15	0.00	Natural		14	22/04/2021
▲BH SBC021	2.00	J11	2.00	33	15	18	-0.06	Natural		14	04/05/2021
★BH SBC021	3.00	J14	3.00	30	15	15	0.00	Natural		15	04/05/2021
⊙BH SBC021	5.70	J22	5.70	27	13	14	0.07	Natural		14	04/05/2021
◆BH SBC022	1.50	J5	1.50	29	15	14	0.29	Natural		19	04/05/2021
○BH SBC022	4.20	J14	4.20	34	16	18	0.28	Natural		21	04/05/2021
△BH SBC023A	3.00	J14	3.00	30	14	16	0.00	Natural		14	10/05/2021
⊗BH SBC023A	9.25	J24	9.25	33	16	17	0.18	Natural		19	12/05/2021
⊕BH SBC023A	15.00	J36	15.00	39	19	20	0.45	Natural		28	30/04/2021

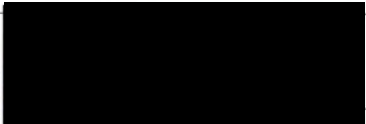
For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Name :-

**M. SELKIRK**

Page 5 of 13

Date of Issue :-

03/09/2021

Certificate No :-

PI/4322A/5

AEG Contract No. :-

4322A



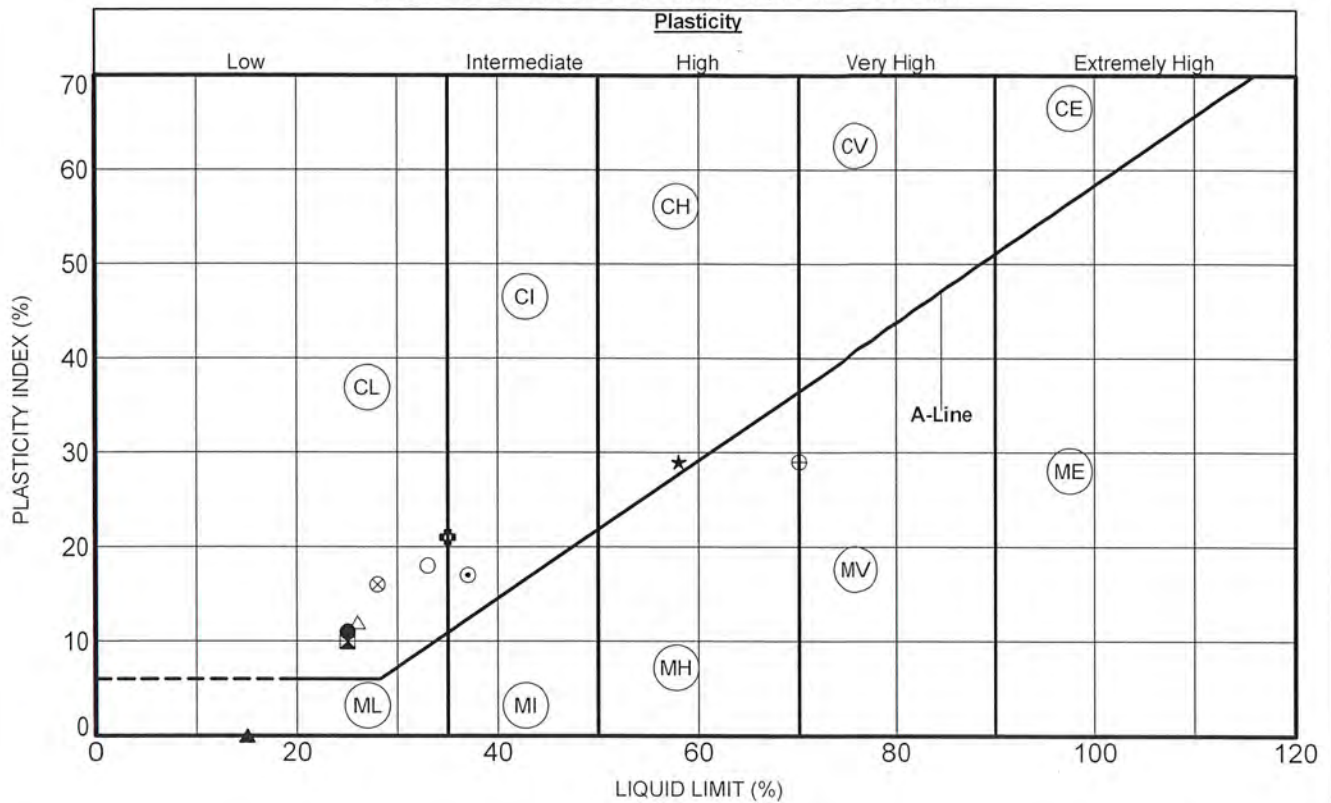


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC024	2.00	J6	2.00	25	14	11	0.00	Natural		14	04/05/2021
⊗BH SBC024	3.20	J11	3.20	25	15	10	0.50	Natural		20	04/05/2021
▲BH SBC024	6.20	J21	6.20		15			Natural		29	04/05/2021
★BH SBC025	0.02	J1	0.02	58	29	29	0.45	Natural		42	12/05/2021
○BH SBC025	0.60	J9	0.60	37	20	17	0.00	Natural		20	10/05/2021
◆BH SBC025	6.70	J26	6.70	35	14	21	0.05	Natural		15	28/04/2021
○BH SBC026	1.55	J8	1.55	33	15	18	0.17	Natural		18	04/05/2021
△BH SBC026	4.10	J17	4.10	26	14	12	0.33	Natural		18	04/05/2021
⊗BH SBC026	6.10	J22	6.10	28	12	16	0.06	Natural		13	04/05/2021
⊕BH SBC027	0.05	J1	0.05	70	41	29	0.41	Natural		53	04/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9 Client :- AMEY OW Limited

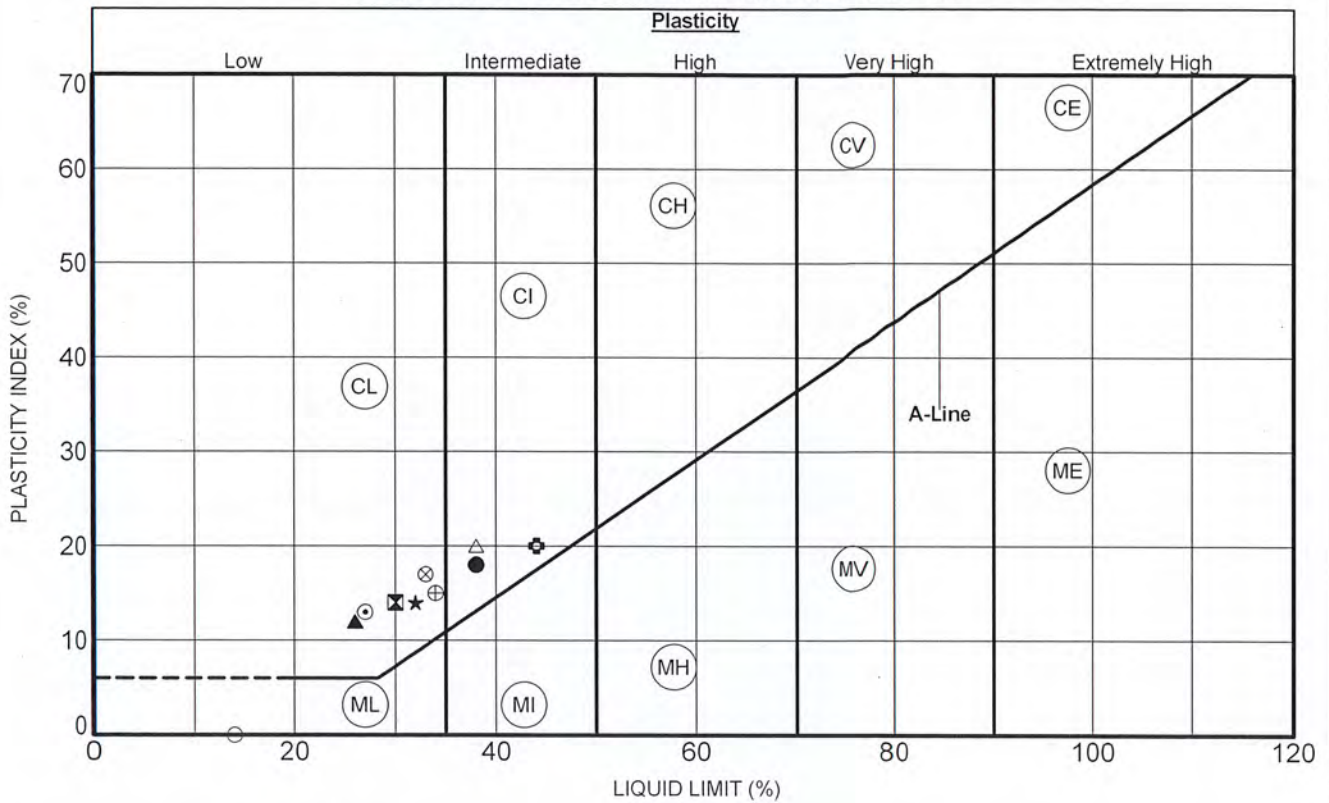
		Name :- <b>M. SELKIRK</b>	Page 6 of 13	
	Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/6	AEG Contract No. :- 4322A	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT



Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	L	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC027	0.50	J6	0.50	38	20	18	0.06	Natural		21	04/05/2021
⊗BH SBC027	1.80	J11	1.80	30	16	14	-0.21	Natural		13	04/05/2021
▲BH SBC027	5.20	J21	5.20	26	14	12	-0.08	Natural		13	07/05/2021
★BH SBC028	1.10	J7	1.10	32	18	14	0.21	Natural		21	30/04/2021
⊙BH SBC028	3.95	J15	3.95	27	14	13	0.08	Natural		15	22/04/2021
⊕BH SBC029	0.20	J2	0.20	44	24	20	0.25	Natural	88.2	29	22/04/2021
○BH SBC029	2.50	J11	2.50		14			Natural		23	28/04/2021
△BH SBC030	0.70	J4	0.70	38	18	20	0.10	Natural		20	12/05/2021
⊗BH SBC030	2.50	J12	2.50	33	16	17	-0.12	Natural		14	10/05/2021
⊕BH SBC031	3.00	J12	3.00	34	19	15	0.13	Natural		21	04/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Name :- <b>M. SELKIRK</b>	Page 7 of 13	
	Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/7	

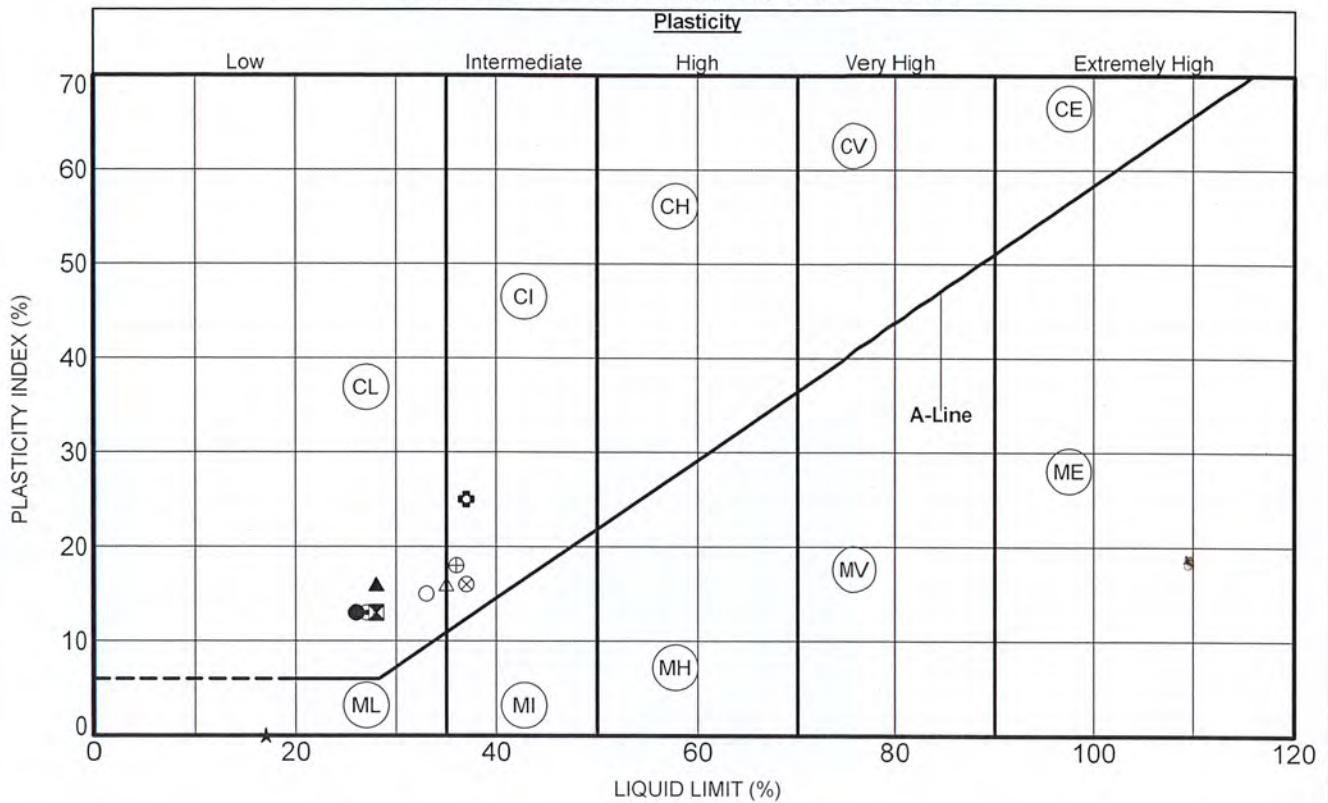


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I <sub>L</sub>	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●BH SBC031	6.00	J18	6.00	26	13	13	0.08	Natural		14	04/05/2021
⊗BH SBC031	9.00	J24	9.00	28	15	13	-0.15	Natural		13	04/05/2021
▲BH SBC031	12.00	J30	12.00	28	12	16	0.13	Natural		14	04/05/2021
★BH SBC032	1.20	J7	1.20		17			Natural		29	04/05/2021
⊙BH SBC032A	5.45	J4	5.45	27	14	13	-0.15	Natural		12	04/05/2021
◆BH SBC032A	8.45	J10	8.45	37	12	25	0.00	Natural		12	04/05/2021
○TP SBC001	1.50	J6	1.50	33	18	15	0.13	Natural		20	22/04/2021
△TP SBC002	0.30	J3	0.30	35	19	16	-0.13	Natural		17	13/04/2021
⊗TP SBC003	0.35	J3	0.35	37	21	16	0.06	Natural		22	09/04/2021
⊕TP SBC004	1.60	J8	1.60	36	18	18	0.06	Natural		19	14/04/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Date of Issue :- 03/09/2021

Name :- **M. SELKIRK**

Certificate No :- PI/4322A/8

AEG Contract No. :- 4322A

Page 8 of 13

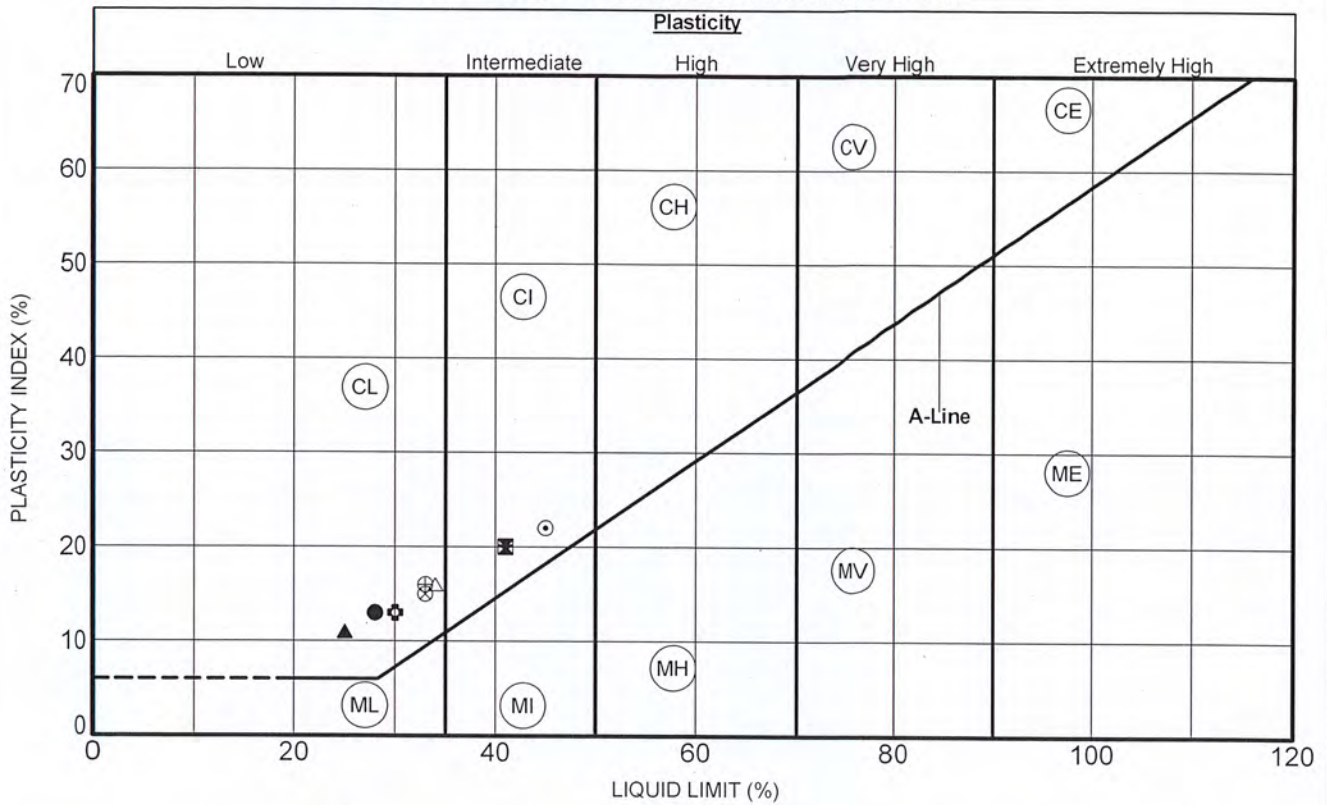


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BU

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I <sub>L</sub>	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
● TP SBC005	3.50	J11	3.50	28	15	13	0.00	Natural		15	09/04/2021
⊠ TP SBC006	0.40	J2	0.40	41	21	20	0.35	Natural		28	09/04/2021
▲ TP SBC006	2.90	J13	2.90	25	14	11	0.09	Natural		15	09/04/2021
★ TP SBC007	0.40	J3	0.40	41	21	20	0.50	Natural		31	13/04/2021
⊙ TP SBC008	0.50	J3	0.50	45	23	22	0.18	Natural		27	13/04/2021
◆ TP SBC009	1.60	J9	1.60	30	17	13	0.46	Natural		23	14/04/2021
○ TP SBC009	2.80	B13	2.80	33	18	15	0.20	Natural		21	29/04/2021
△ TP SBC010	1.00	B6	1.00	34	18	16	0.13	Natural		20	29/04/2021
⊗ TP SBC011	2.40	J10	2.40	33	18	15	-0.07	Natural		17	08/04/2021
⊕ TP SBC012A	2.90	J9	2.90	33	17	16	-0.06	Natural		16	13/04/2021

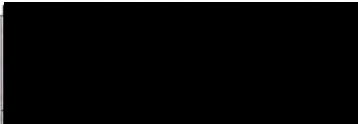
For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Name :-

**M. SELKIRK**

Page 9 of 13

Date of Issue :-

03/09/2021

Certificate No :-

PI/4322A/9

AEG Contract No. :-

4322A



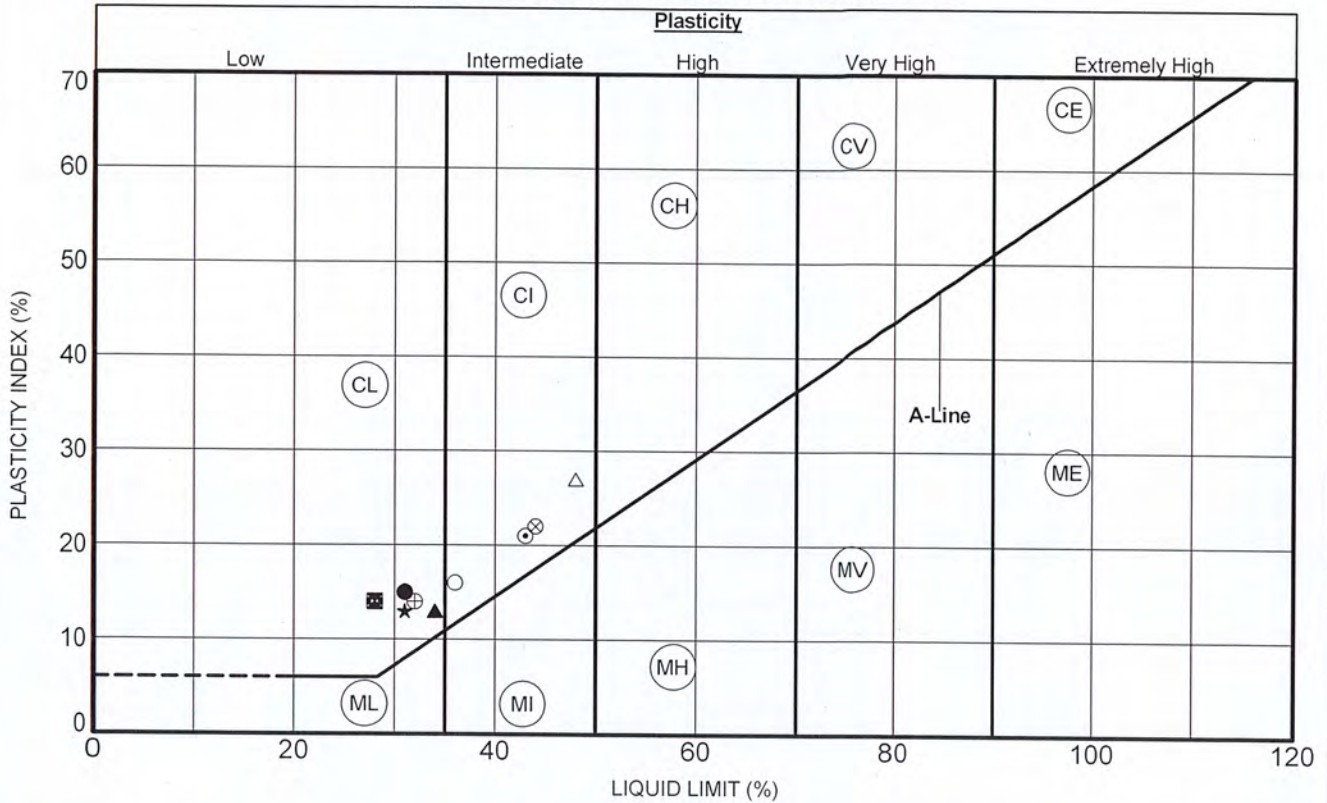


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5B

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I <sub>L</sub>	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●TP SBC013	3.00	B10	3.00	31	16	15	0.07	Natural	62.0	17	07/05/2021
⊗TP SBC013	4.50	J14	4.50	28	14	14	0.07	Natural		15	10/05/2021
▲TP SBC014	0.40	B4	0.40	34	21	13	0.00	Natural	60.0	21	28/04/2021
★TP SBC015	0.50	J3	0.50	31	18	13	-0.15	Natural		16	13/05/2021
⊙TP SBC016	1.50	J6	1.50	43	22	21	-0.10	Natural		20	12/05/2021
⊕TP SBC017	4.30	J18	4.30	28	14	14	-0.07	Natural		13	10/05/2021
○TP SBC018	1.80	J8	1.80	36	20	16	-0.06	Natural		19	13/04/2021
△TP SBC019	0.30	J2	0.30	48	21	27	0.11	Natural		24	12/05/2021
⊗TP SBC020	0.70	J6	0.70	44	22	22	-0.09	Natural		20	13/05/2021
⊕TP SBC021	1.50	J8	1.50	32	18	14	-0.07	Natural		17	30/04/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



[Redacted Name]

Name :-

**M. SELKIRK**

Page 10 of 13

Date of Issue :-

03/09/2021

Certificate No :-

PI/4322A/10

AEG Contract No. :-

4322A



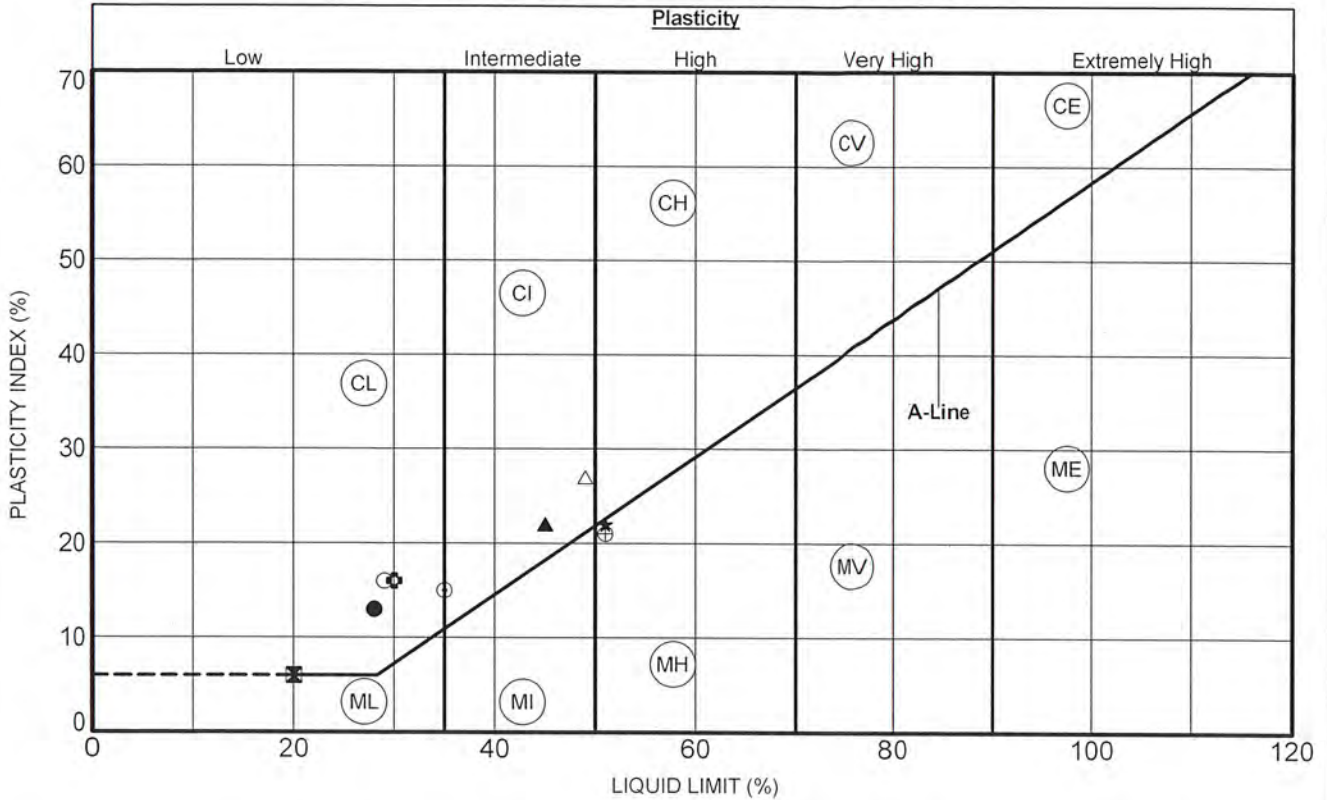
1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BU

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	$I_L$	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
● TP SBC022	3.50	J11	3.50	28	15	13	0.08	Natural		16	28/04/2021
⊗ TP SBC023	1.50	J6	1.50	20	14	6	0.00	Air Dried	40.0	14	22/04/2021
▲ TP SBC024	0.50	J3	0.50	45	23	22	0.05	Natural		24	08/04/2021
★ TP SBC025	0.15	J1	0.15	51	29	22	0.77	Natural		46	08/04/2021
⊙ TP SBC026	0.50	J3	0.50	35	20	15	0.33	Natural		25	09/04/2021
◆ TP SBC027	3.50	J12	3.50	30	14	16	0.06	Natural		15	12/05/2021
○ TP SBC028	4.50	J18	4.50	29	13	16	-0.06	Natural		12	08/04/2021
△ TP SBC029	0.30	J2	0.30	49	22	27	0.04	Natural		23	08/04/2021
⊗ TP SBC030	2.50	J12	2.50	28	15	13	-0.31	Natural		11	28/04/2021
⊕ TP SBC031	0.10	J1	0.10	51	30	21	0.29	Natural		36	08/04/2021

For description of sample please refer to the Laboratory Sample Description Sheet, # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Name :- <b>M. SELKIRK</b>	Page 11 of 13	
	Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/11	

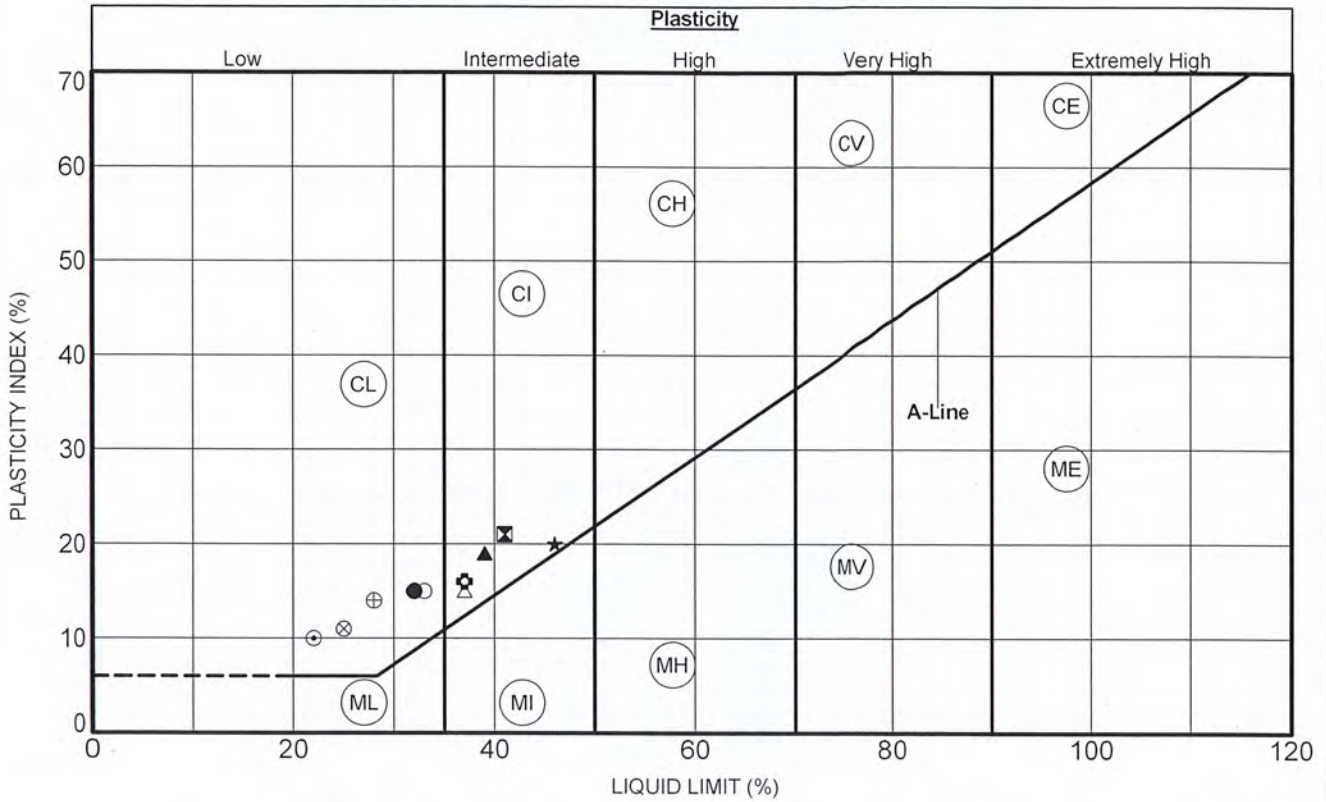


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I <sub>L</sub>	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●TP SBC032	1.50	J9	1.50	32	17	15	0.07	Natural		18	13/04/2021
⊠TP SBC033	0.80	J5	0.80	41	20	21	0.05	Natural		21	14/04/2021
▲TP SBC034	0.50	J3	0.50	39	20	19	0.05	Natural		21	09/04/2021
★TP SBC035	0.20	J1	0.20	46	26	20	0.45	Natural		35	22/04/2021
⊙TP SBC035	3.00	J13	3.00	22	12	10	-0.10	Natural		11	22/04/2021
◆TP SBC036	0.50	J3	0.50	37	21	16	-0.44	Natural		14	10/05/2021
○TP SBC036	3.50	J11	3.50	33	18	15	0.27	Natural		22	10/05/2021
△TP SBC038	0.50	J3	0.50	37	22	15	0.13	Natural		24	10/05/2021
⊗TP SBC039	1.50	J6	1.50	25	14	11	-0.09	Natural		13	10/05/2021
⊕TP SBC039	2.50	J9	2.50	28	14	14	0.14	Natural		16	10/05/2021

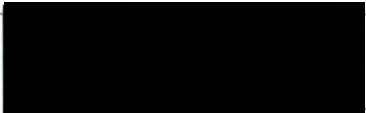
For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Name :-

M. SELKIRK

Page 12 of 13

Date of Issue :-

03/09/2021

Certificate No :-

PI/4322A/12

AEG Contract No. :-

4322A

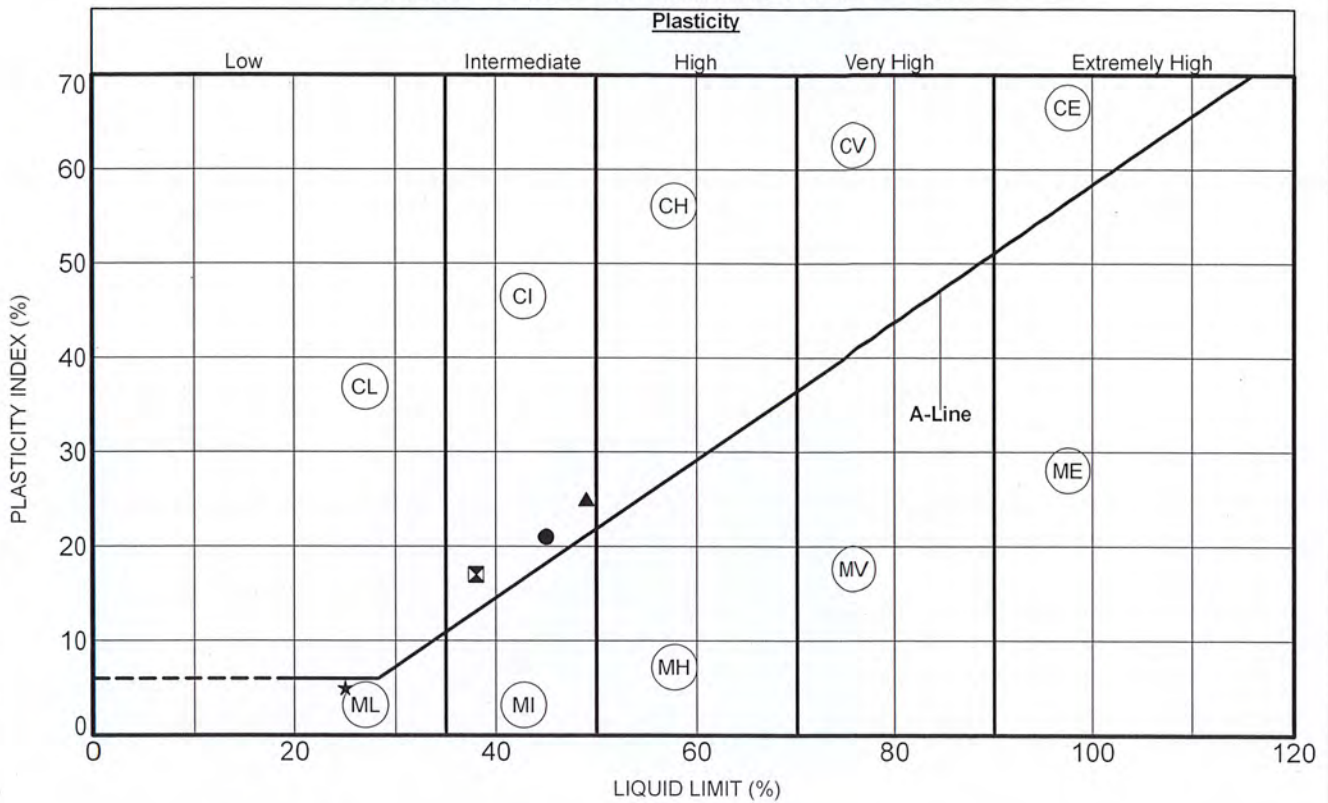


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ATTERBERG LIMITS & NATURAL MOISTURE CONTENT


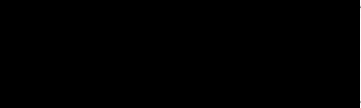
Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I <sub>L</sub>	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●TP SBC040	0.10	J1	0.10	45	24	21	0.14	Natural		27	22/04/2021
⊠TP SBC041	0.50	J3	0.50	38	21	17	0.24	Natural		25	10/05/2021
▲TP SBC042	0.30	J2	0.30	49	24	25	0.20	Natural		29	30/04/2021
★TP SBC044	0.80	J4	0.80	25	20	5	0.60	Natural		23	12/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI  
 If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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		Name :- <b>M. SELKIRK</b>	Page 13 of 13
		Date of Issue :- 03/09/2021	Certificate No :- PI/4322A/13 AEG Contract No. :- <b>4322A</b>



## Determination of Density by Linear Measurement



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fall, Chester-le-Street, Co. Durham, DH2 3  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF DENSITY BY LINEAR MEASUREMENT

BS 1377 : Part 2 : Clause 7 : 1990

Exploratory Hole No.:-	Sample Type & No.:-	Sample Depth (m):-	Specific Depth (m):-	Bulk Density (Mg/m <sup>3</sup> ):-	Dry Density (Mg/m <sup>3</sup> ):-	Moisture Content (%):-	Date Tested	Test Method
BH SBC006	B12	2.50	2.50	2.08	1.68	24	21/04/2021	Undisturbed
BH SBC007	B6	1.00	1.00	2.01	1.62	24	05/04/2021	2.5kg Remould @ NMC
BH SBC012	B32	7.60	7.60	2.20	1.88	17	06/05/2021	Undisturbed
BH SBC013	B32	10.00	10.00	2.07	1.73	20	17/05/2021	Undisturbed
BH SBC020	B17	4.00	4.00	2.15	1.84	17	05/05/2021	Undisturbed
BH SBC021	B12	2.00	2.00	2.08	1.81	15	19/05/2021	Undisturbed
TP SBC012A	B13	4.00	4.00	2.16	1.91	13	26/04/2021	Undisturbed
TP SBC013	B12	4.00	4.00	2.24	1.96	14	06/05/2021	4.5kg Remould @ NMC
TP SBC014	B14	2.80	2.80	2.03	1.70	20	23/04/2021	Undisturbed
TP SBC028	B16	4.00	4.00	2.27	2.01	13	22/04/2021	Undisturbed

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
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	Signed :- [Redacted Signature]	Name :- <b>M. SELKIRK</b>	Page 1 of 1	
Date of issue :- 24/05/2021	Certificate No :- DENS/4322A/1	AEG Contract No. :- <b>4322A</b>		



## Determination of Particle Density

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL


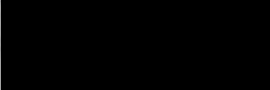


## DETERMINATION OF PARTICLE DENSITY

BS1377 : Part 2 : Clause 8.2 : 1990

Exploratory Hole No.	Depth (m)	Sample Type & No.	Specific Depth (m)	Particle Density (Mg/m <sup>3</sup> )	Date Tested
BH SBC005	0.00	B3	0.00	2.57	15/05/2021
BH SBC007	2.00	B11	2.00	2.65	24/05/2021
BH SBC012	5.20	B24	5.20	2.53	07/05/2021
BH SBC018	1.50	B6	1.50	2.66	21/05/2021
BH SBC020	4.00	B17	4.00	2.65	21/05/2021
BH SBC021	2.00	B12	2.00	2.64	21/05/2021
TP SBC001	1.00	B4	1.00	2.65	21/05/2021
TP SBC005	1.00	B4	1.00	2.66	20/05/2021
TP SBC011	2.00	B9	2.00	2.58	07/05/2021
TP SBC013	4.00	B12	4.00	2.64	20/05/2021
TP SBC014	1.60	B9	1.60	2.64	20/05/2021
TP SBC014	2.80	B14	2.80	2.80	07/05/2021
TP SBC017	2.00	B10	2.00	2.64	15/05/2021
TP SBC018	2.00	B9	2.00	2.63	17/05/2021
TP SBC021	1.00	B6	1.00	2.64	07/05/2021
TP SBC022	3.00	B10	3.00	2.66	20/05/2021
TP SBC024	1.00	B4	1.00	2.64	07/05/2021
TP SBC024	2.00	B7	2.00	2.56	07/05/2021
TP SBC026	1.00	B5	1.00	2.65	15/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
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	Signed 	Name :- 	Page 1 of 2	
	Date of issue :- 24/05/2021	Certificate No :- PD/4322A/1	AEG Contract No. :- <b>4322A</b>	



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL




## DETERMINATION OF PARTICLE DENSITY

BS1377 : Part 2 : Clause 8.2 : 1990

Exploratory Hole No.	Depth (m)	Sample Type & No.	Specific Depth (m)	Particle Density (Mg/m <sup>3</sup> )	Date Tested
TP SBC027	3.00	B11	3.00	2.67	20/05/2021
TP SBC028	4.80	B19	4.80	2.65	20/05/2021
TP SBC031	0.80	B6	0.80	2.63	15/05/2021
TP SBC032	1.00	B7	1.00	2.65	15/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
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	Signed: 	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold; color: red;">M. SELKIRK</span>	Page 2 of 2	
	Date of issue :- 24/05/2021	Certificate No :- PD/4322A/2	AEG Contract No. :- <b>4322A</b>	

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9		Contract No A13955																					
Client Allied Exploration & Geotechnics Limited		Engineer		~ Indicates test not carried out																					
Sample Identification		Sample Type		Lab Sample ID		Non Engineering Sample Description		Moisture Content		Atterberg limits					Particle Density		Density		Total Stress			Other Tests			
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Non Engineering Sample Description	Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index	Percentage retained 425µm	Atterberg Classification	Particle Density	Bulk	Dry	Shear Strength	Apparent Cohesion	Angle of Shearing Resistance Phi	PSD	Compaction MCV Cal	Compaction MCV Cal	PSD	Compaction MCV Cal	Compaction MCV Cal	Compaction MCV Cal	
BH SBC013	8.50		B28	186682	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse	19	~	~	~	~	~	2.65	~	~	~	~	~	~	~	~	~	~	~	~	~
BH SBC021	0.05		B2	186683	Brown clayey very gravelly very sandy SILT. Gravel is fine to coarse	31	~	~	~	~	~	2.50	~	~	~	~	~	~	~	~	~	~	~	~	
BH SBC024	4.50		B17	186684	Brown clayey gravelly very sandy SILT. Gravel is fine to coarse	33	~	~	~	~	~	2.62	~	~	~	~	~	~	~	~	~	~	~	~	
BH SBC026	2.30		B12	186685	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse	12	~	~	~	~	~	2.63	~	~	~	~	~	~	~	~	~	~	~	~	
BH SBC027	0.05		B2	186686	Brown clayey very gravelly very sandy SILT. Gravel is fine to coarse	24	~	~	~	~	~	2.56	~	~	~	~	~	~	~	~	~	~	~	~	
Notes		Opinions and interpretations are outside the scope of UKAS accreditation		UKAS Accredited Test Y/N		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Test details are given on the 'Notes on Laboratory Procedures' sheet					See individual report sheets		
Originator	Checked & Approved																								
SM	07/06/2021																								



SUMMARY OF GEOTECHNICAL TESTS



TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9		Contract No A13955					
Client Allied Exploration & Geotechnics Limited		Engineer		~ Indicates test not carried out					
Sample Identification		Non Engineering Sample Description		Other Tests					
Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Moisture Content %	Atterberg limits	Density	Total Stress	
						Liquid Limit % Plastic Limit % Plasticity Index Percentage retained 425µm % Atterberg Classification	Bulk Mg/m <sup>3</sup> Dry Mg/m <sup>3</sup>	Shear Strength kPa Apparent Cohesion C kPa Angle of Shearing Resistance Phi	
TP SBC030	2.00		B10	186687	12				Compaction MCV Cal
Notes		Opinions and interpretations are outside the scope of UKAS accreditation		UKAS Accredited Test Y/N		Test details are given on the 'Notes on Laboratory Procedures' sheet		See individual report sheets	
Originator	Checked & Approved								
SM									



SUMMARY OF GEOTECHNICAL TESTS

## Particle Size Distribution Sieving and Sedimentation





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

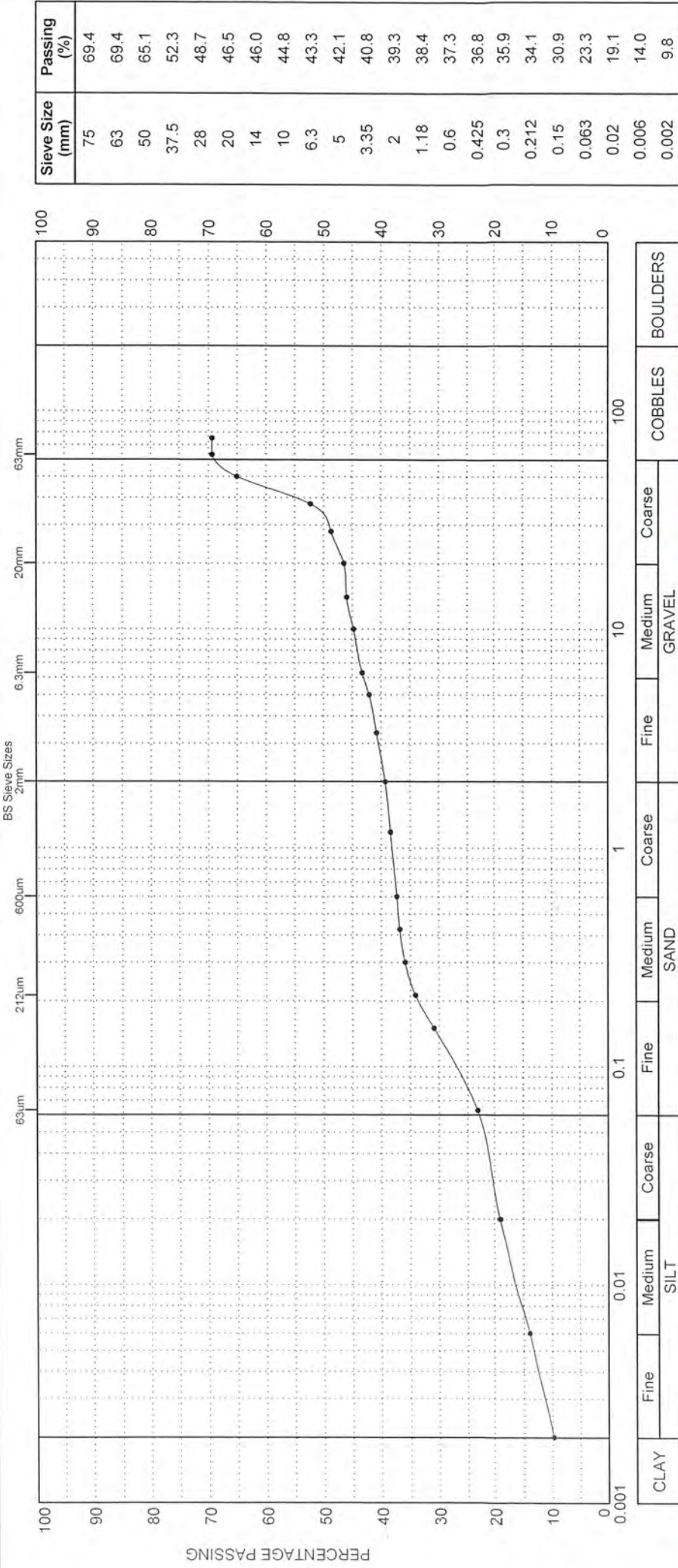
Exploratory Hole No :- BH SBC001

Depth (m) :- 0.50

Sample Type & No :- B5

Specific Depth (m) :- 0.50

Date Tested :- 19/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC001/B5/0.50		Name :- <span style="background-color: black; color: black;">[REDACTED]</span>	Signed :- <span style="background-color: black; color: black;">[REDACTED]</span>	Page 1 of 1
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9				

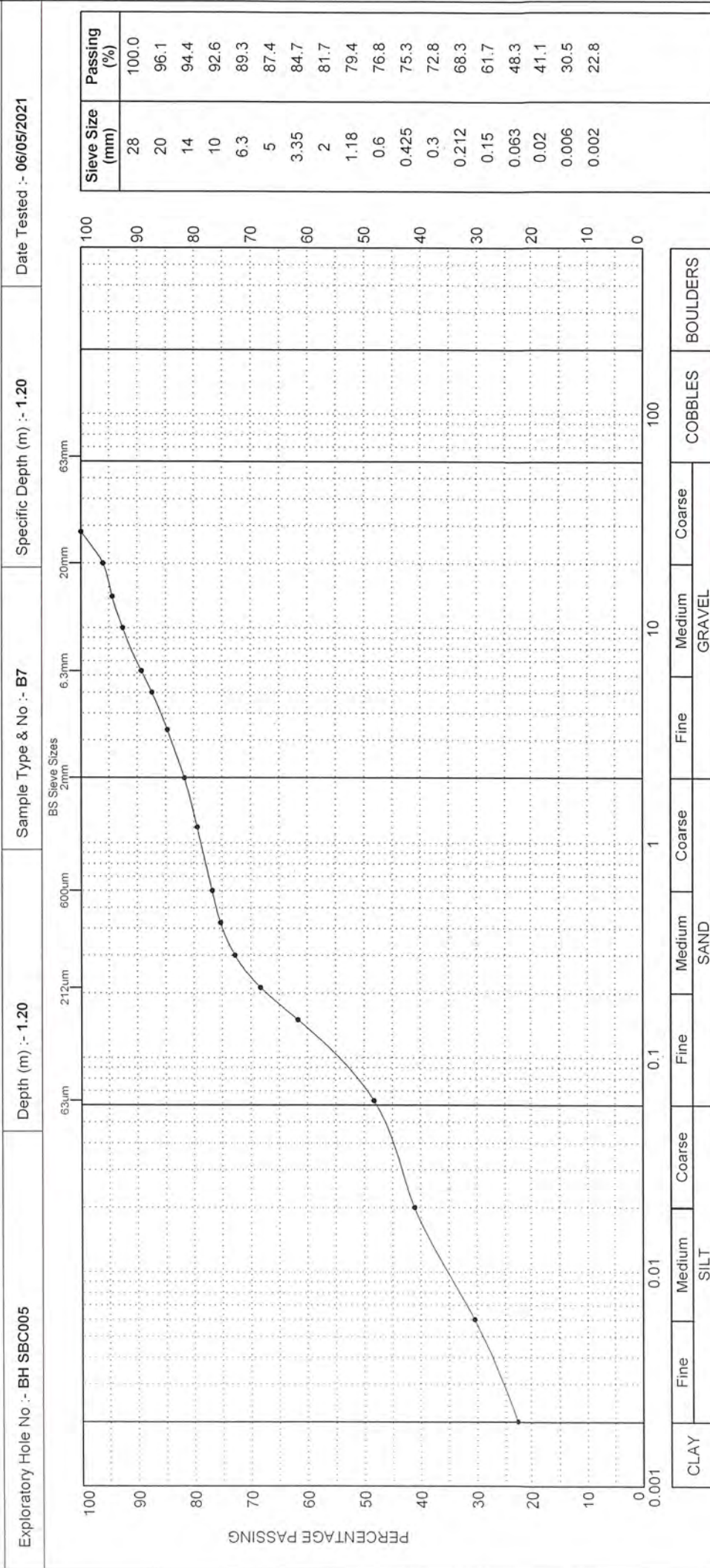


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Salford Mill Industrial Estate, Palfon Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 24/05/2021	Certificate No :- PSD/4322A/BH SBC005/B7/1.20	Signed 	Name :- 	Page 1 of 1
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		1367

**M. SELKIRK**



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Palfon Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20, Business Development Centre, Emsay Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No. :- BH SBC007	Depth (m) :- 1.00	Sample Type & No. :- B6	Specific Depth (m) :- 1.00	Date Tested :- 05/05/2021																																										
<table border="1"> <thead> <tr> <th>Sieve Size (mm)</th> <th>Passing (%)</th> </tr> </thead> <tbody> <tr><td>50</td><td>100.0</td></tr> <tr><td>37.5</td><td>96.0</td></tr> <tr><td>28</td><td>94.9</td></tr> <tr><td>20</td><td>93.2</td></tr> <tr><td>14</td><td>90.4</td></tr> <tr><td>10</td><td>88.2</td></tr> <tr><td>6.3</td><td>85.3</td></tr> <tr><td>5</td><td>82.6</td></tr> <tr><td>3.35</td><td>79.7</td></tr> <tr><td>2</td><td>77.6</td></tr> <tr><td>1.18</td><td>75.9</td></tr> <tr><td>0.6</td><td>73.8</td></tr> <tr><td>0.425</td><td>72.7</td></tr> <tr><td>0.3</td><td>70.9</td></tr> <tr><td>0.212</td><td>68.1</td></tr> <tr><td>0.15</td><td>63.3</td></tr> <tr><td>0.063</td><td>50.5</td></tr> <tr><td>0.02</td><td>43.7</td></tr> <tr><td>0.006</td><td>34.3</td></tr> <tr><td>0.002</td><td>26.3</td></tr> </tbody> </table>					Sieve Size (mm)	Passing (%)	50	100.0	37.5	96.0	28	94.9	20	93.2	14	90.4	10	88.2	6.3	85.3	5	82.6	3.35	79.7	2	77.6	1.18	75.9	0.6	73.8	0.425	72.7	0.3	70.9	0.212	68.1	0.15	63.3	0.063	50.5	0.02	43.7	0.006	34.3	0.002	26.3
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<p>For description of sample please refer to the Laboratory Sample Description Sheet</p>																																														
<p>Date of issue :- 24/05/2021</p>		<p>Certificate No. :- PSD/4322A/BH SBC007/B6/1.00</p>																																												
<p>Client :- AMEY OW Limited</p>		<p>Contract Title :- A66 North Trans Pennine Scheme C Section 9</p>																																												
<p>Signed</p>		<p>Name :- M. SELKIRK</p>																																												
<p>Page 1 of 1</p>		<p>AEG Contract No. :- 4322A</p>																																												

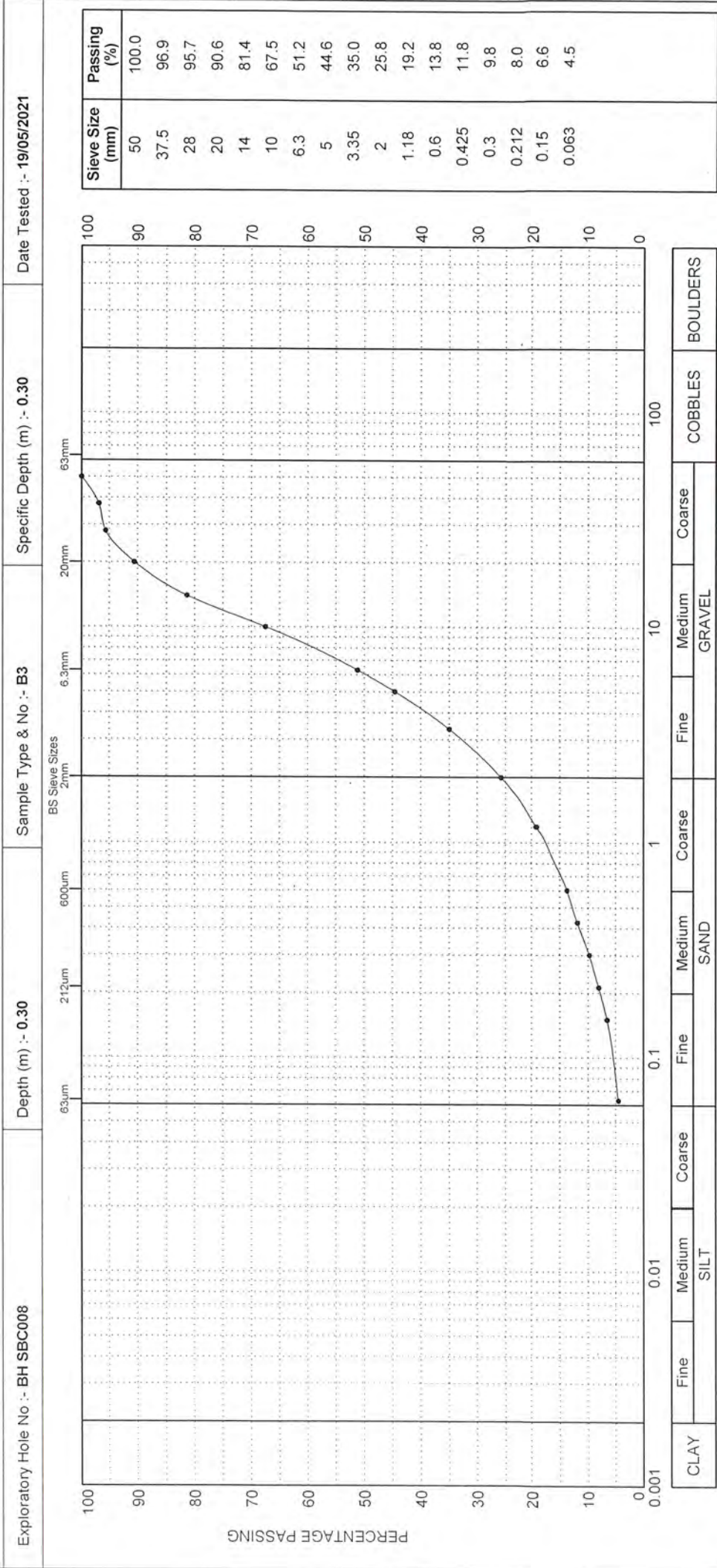


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 26/05/2021	Certificate No. :- PSD/4322A/BH SBC008/B3/0.30	Signed [Redacted]	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A	

Page 1 of 1



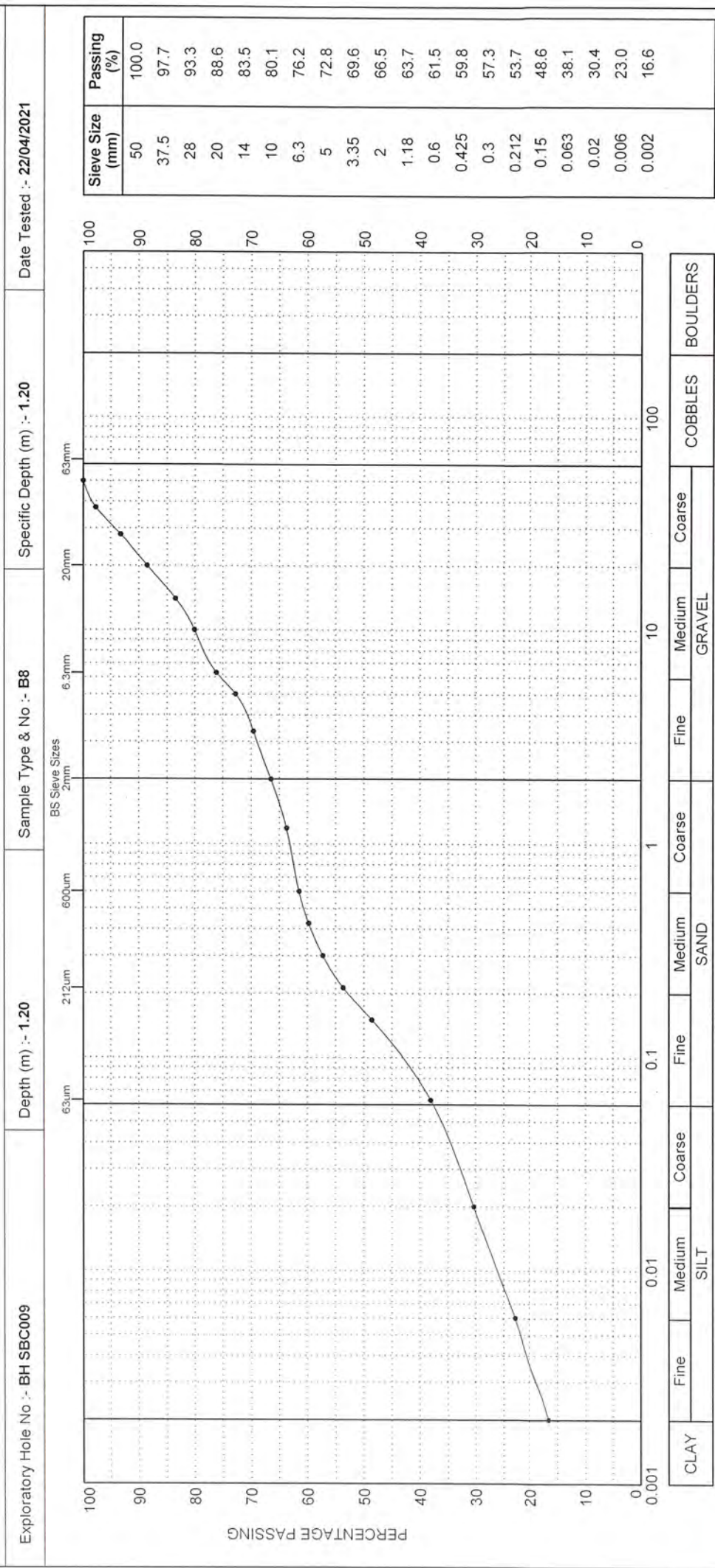


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20, Business Development Centre, Earsam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/BH SBC009/B8/1.20	Signed [Redacted]	Name :- M. SELKIRK
Client :- AMEY OW Limited		Contract Title :- A66 North Pennine Scheme C Section 9	
Page 1 of 1		AEG Contract No :- 4322A	

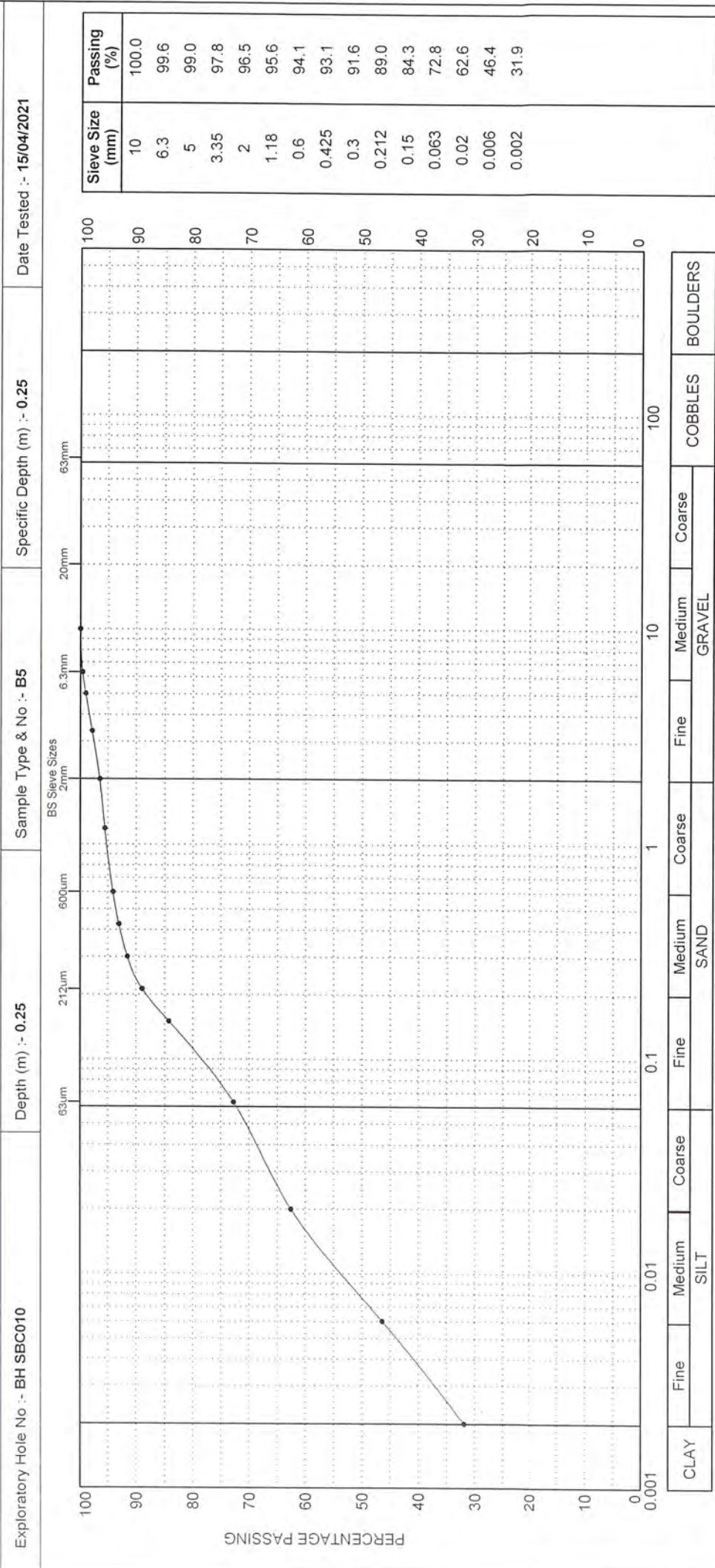


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20, Business Development Centre, Earsom Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No. :- PSD/4322A/BH SBC010/B5/0.25	Signature :- [Redacted]	Name :- M. SELKIRK
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A	

Page 1 of 1





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Stalls Gill Industrial Estate, Palkon, Felt, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Einaam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No. :- BH SBC011	Depth (m) :- 5.40	Sample Type & No. :- B19	Specific Depth (m) :- 5.40	Date Tested :- 20/04/2021																																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sieve Size (mm)</th> <th>Passing (%)</th> </tr> </thead> <tbody> <tr><td>75</td><td>85.0</td></tr> <tr><td>63</td><td>85.0</td></tr> <tr><td>50</td><td>85.0</td></tr> <tr><td>37.5</td><td>82.6</td></tr> <tr><td>28</td><td>77.3</td></tr> <tr><td>20</td><td>75.5</td></tr> <tr><td>14</td><td>73.0</td></tr> <tr><td>10</td><td>71.3</td></tr> <tr><td>6.3</td><td>68.5</td></tr> <tr><td>5</td><td>67.1</td></tr> <tr><td>3.35</td><td>65.0</td></tr> <tr><td>2</td><td>62.7</td></tr> <tr><td>1.18</td><td>60.3</td></tr> <tr><td>0.6</td><td>57.5</td></tr> <tr><td>0.425</td><td>56.2</td></tr> <tr><td>0.3</td><td>54.7</td></tr> <tr><td>0.212</td><td>52.8</td></tr> <tr><td>0.15</td><td>50.2</td></tr> <tr><td>0.063</td><td>43.6</td></tr> <tr><td>0.02</td><td>39.6</td></tr> <tr><td>0.006</td><td>30.7</td></tr> <tr><td>0.002</td><td>18.7</td></tr> </tbody> </table>					Sieve Size (mm)	Passing (%)	75	85.0	63	85.0	50	85.0	37.5	82.6	28	77.3	20	75.5	14	73.0	10	71.3	6.3	68.5	5	67.1	3.35	65.0	2	62.7	1.18	60.3	0.6	57.5	0.425	56.2	0.3	54.7	0.212	52.8	0.15	50.2	0.063	43.6	0.02	39.6	0.006	30.7	0.002	18.7
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For description of sample please refer to the Laboratory Sample Description Sheet																																																		
Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC011/B19/5.40	Signed	Name :- [REDACTED]																																															
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		Page 1 of 1																																														

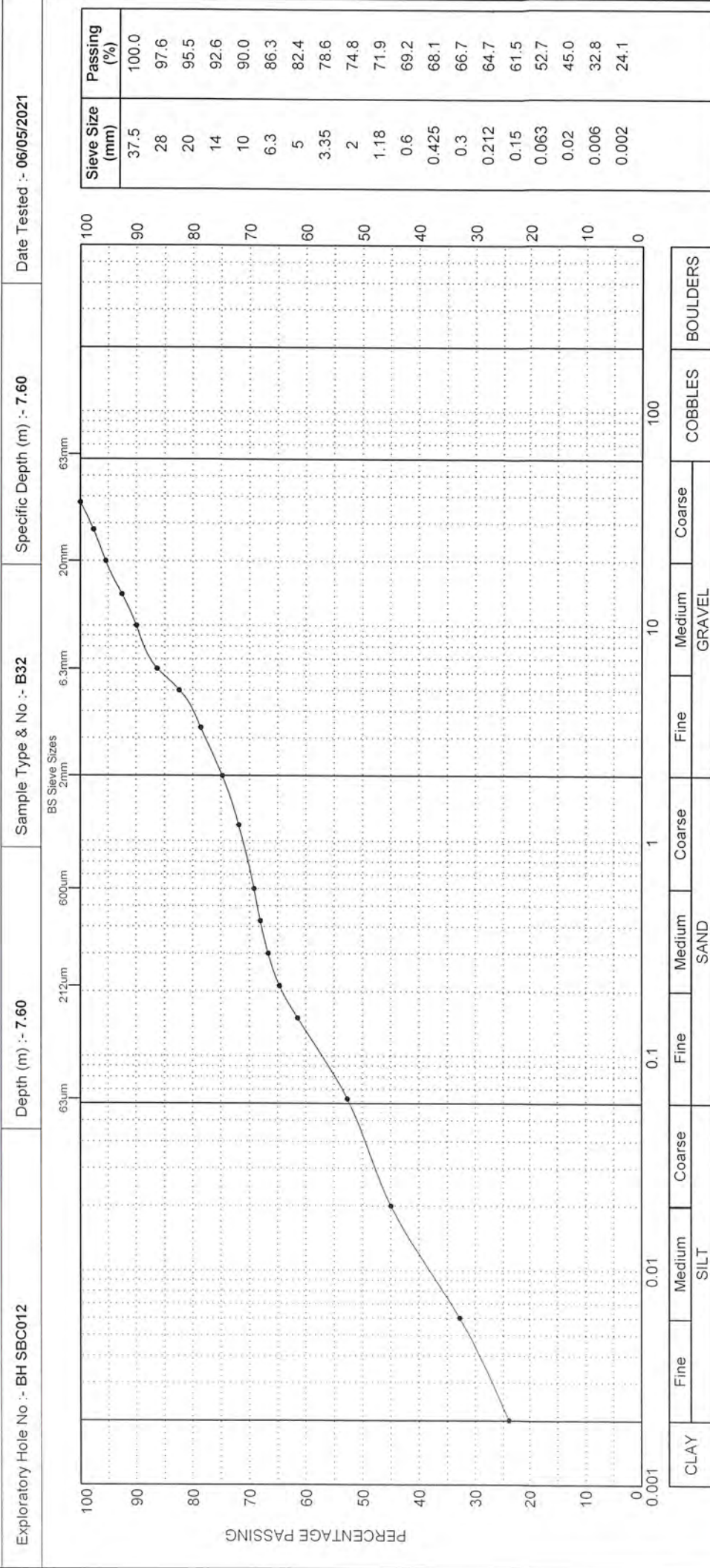


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JF  
Regional Office: Unit 20, Business Development Centre, Earsam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 24/05/2021	Certificate No :- PSD/4322A/BH SBC012/B32/7.60	Signed [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Name :- <b>M. SELKIRK</b>	AEG Contract No :- 4322A







SITE INVESTIGATION AND LABORATORY SERVICES

Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9

Contract No **A13955**

Client Allied Exploration & Geotechnics Limited

Hole BH SBC013

Engineer

Sample Ref

Depth (m) 8.50

Sample Type B28

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	99
14.0 mm	97
10.0 mm	94
6.30 mm	91
5.00 mm	90
3.35 mm	88
2.00 mm	85
1.18 mm	81
630 µm	77
425 µm	75
300 µm	73
200 µm	70
150 µm	65
63 µm	57
20 µm	31
6 µm	17
2 µm	11

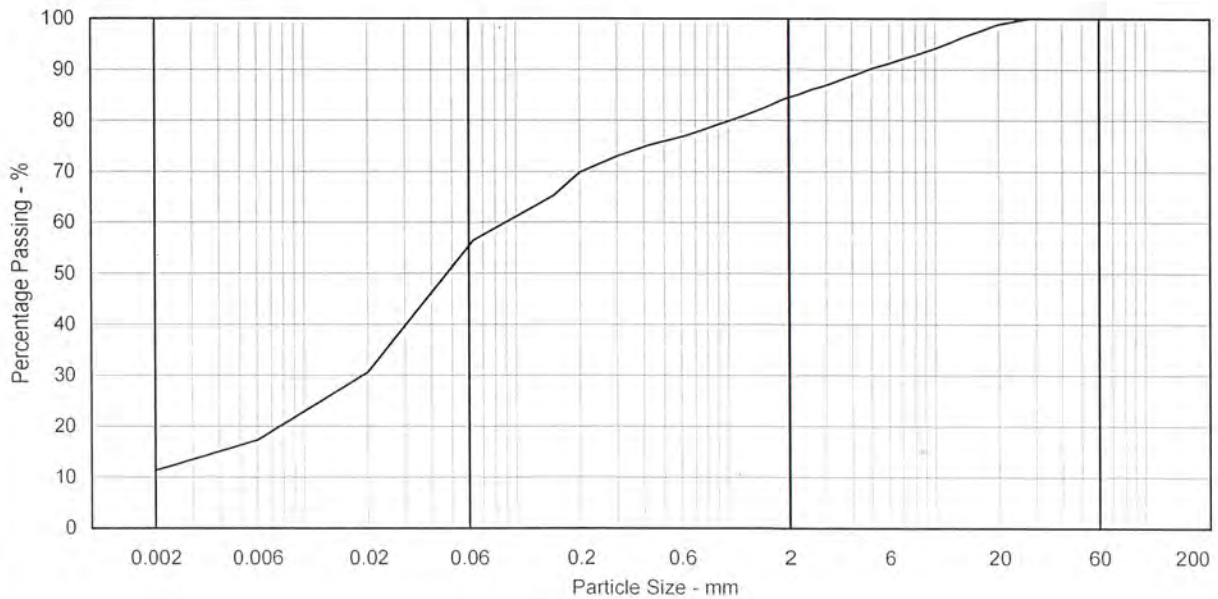
Non Engineering Description
Brown gravelly very sandy silty CLAY. Gravel is fine to coarse

Sample Proportions - %	
Cobbles	0.0
Gravel	15.4
Sand	29.9
Silt	43.4
Clay	11.3

Particle Diameter - mm	
D100	28
D60	0.089
D10	
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	N/A

Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved
DW	[Redacted] 01/06/2021

**PARTICLE SIZE DISTRIBUTION**  
BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method  
BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method

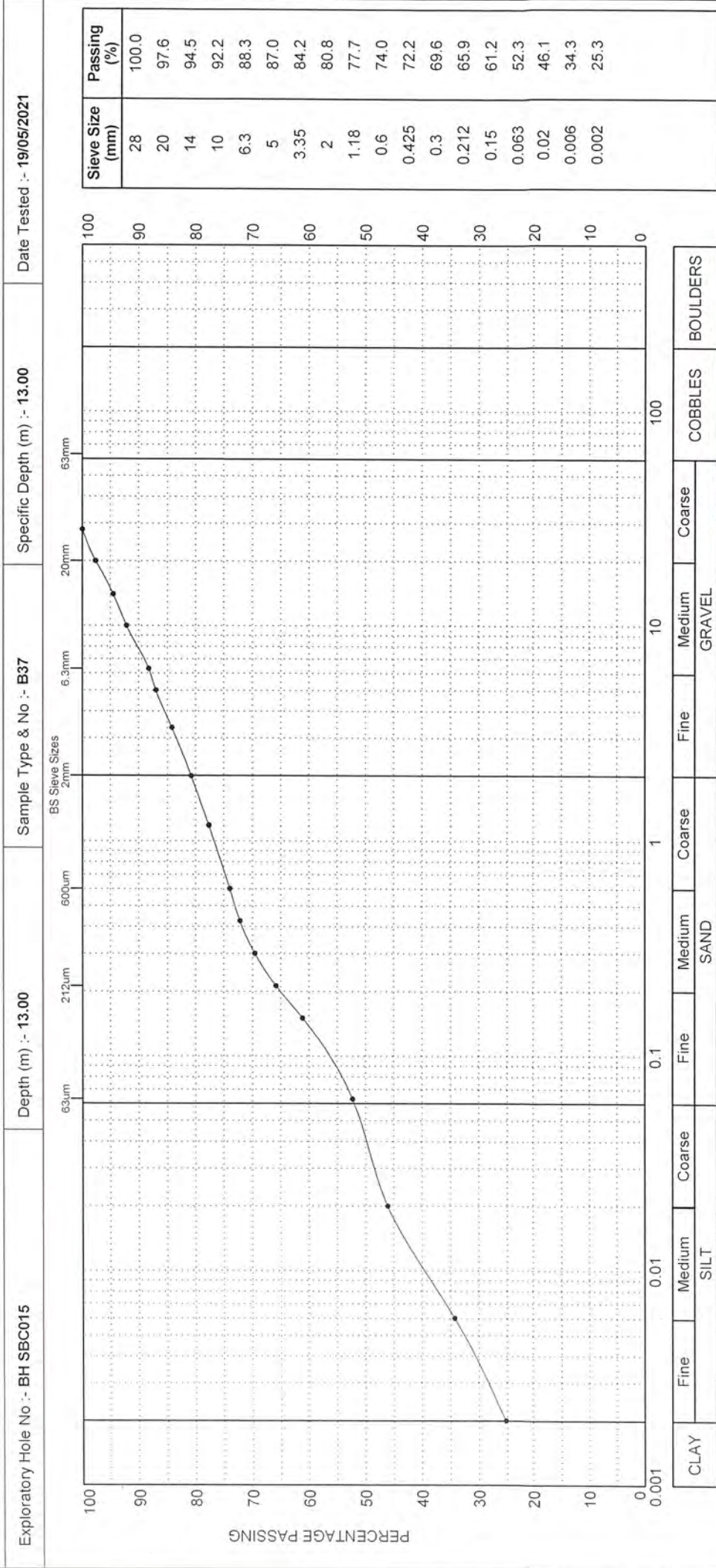


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Oil Industrial Estate, Pelton Hall, Chester-le-Street, Co. Durham, DL3 7JF  
 Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 1

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

<b>Date of issue :-</b> 27/05/2021	<b>Certificate No :-</b> PSD/4322A/BH SBC015/B37/13.00	<b>Signed</b> [Redacted]	<b>Name :-</b> <b>M. SELKIRK</b>	<b>Page 1 of 1</b>
<b>Client :-</b> AMEY OW Limited	<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9		<b>AEG Contract No :-</b> 4322A	





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

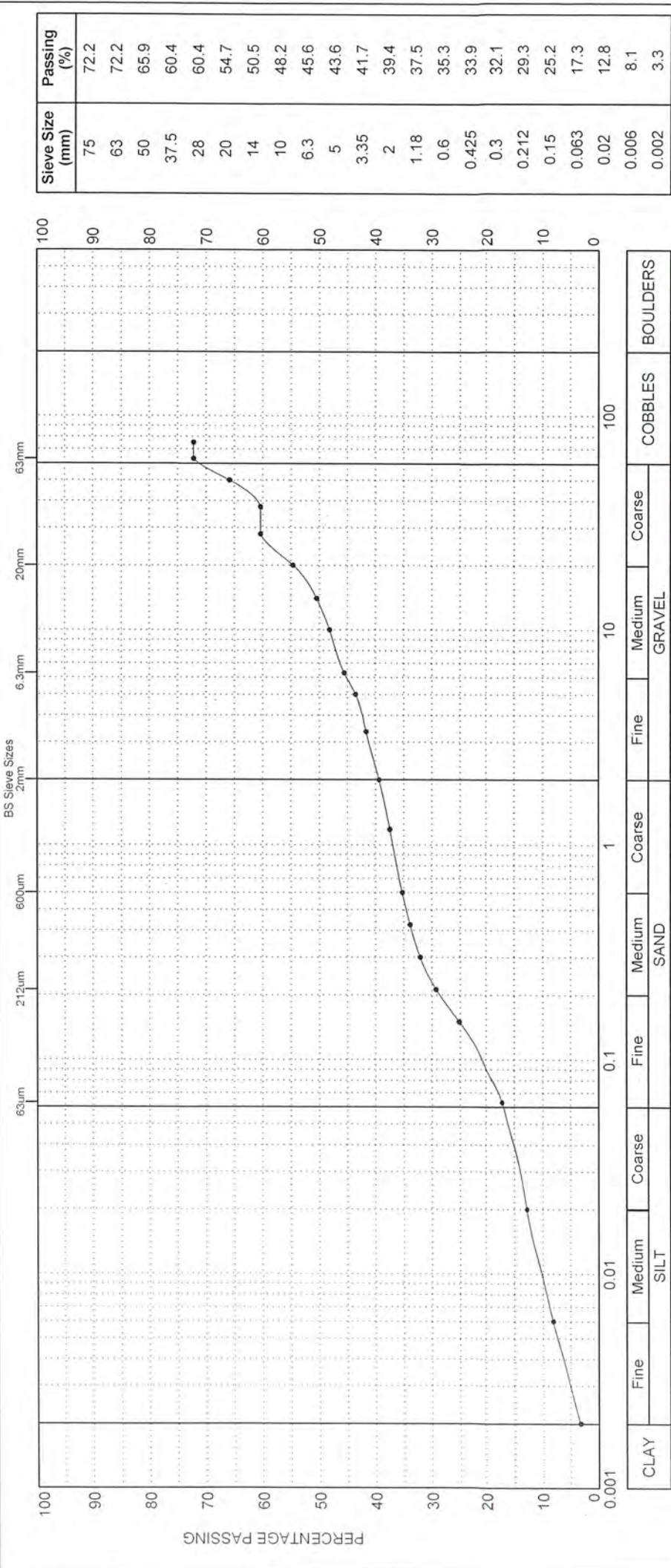
Head Office: Unit 25 Stella Cell Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- BH SBC016      Depth (m) :- 0.50      Sample Type & No :- B2      Specific Depth (m) :- 0.50      Date Tested :- 19/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC016/B2/0.50	Signed :- [Redacted]	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Page 1 of 1	
		AEG Contract No :- 4322A	

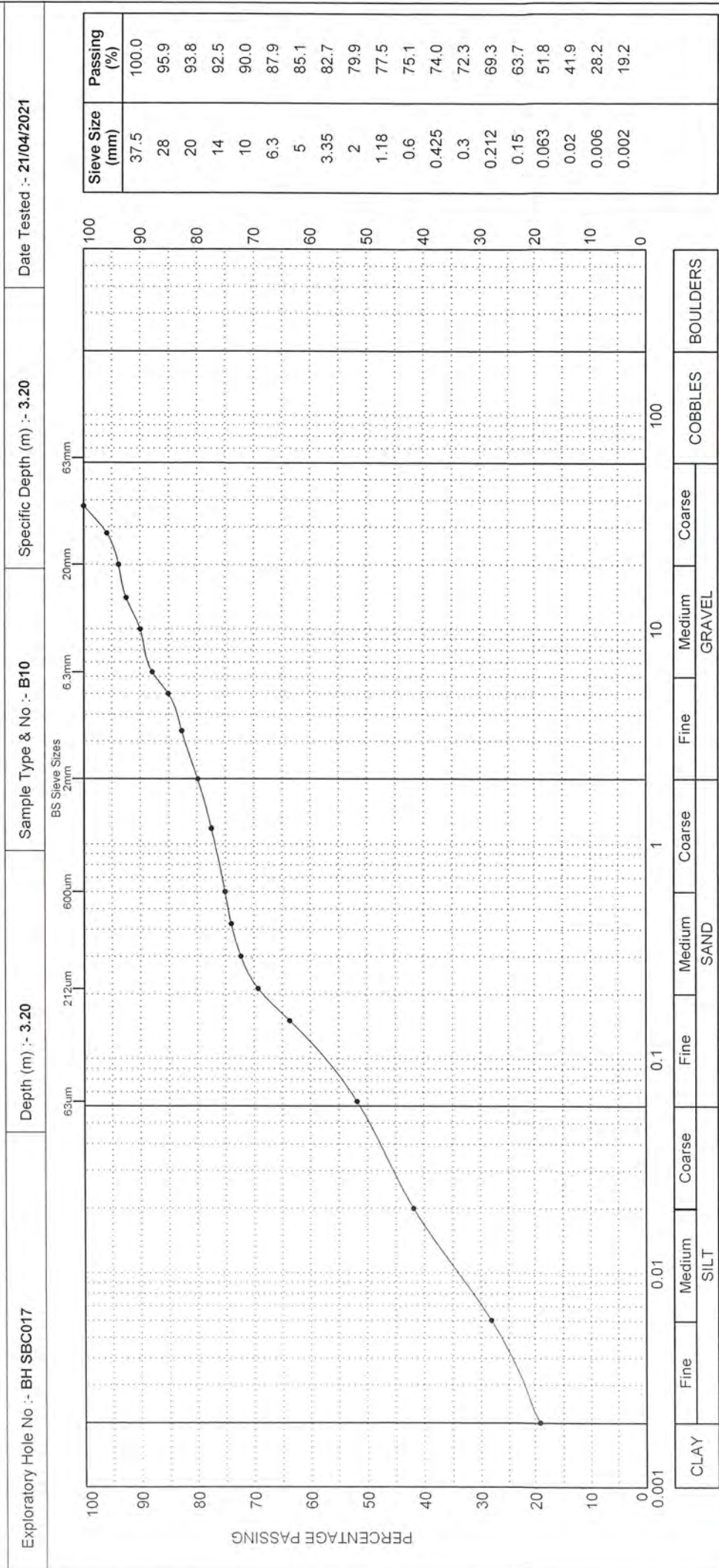


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 3RQ  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL, UK

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC017/B10/3.20	Signed [Redacted]	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Salford Cell Industrial Estate, Palford Park, Chadderton, Co. Durham, DH2 2H  
 Regional Office: Unit 20, Business Development Centre, Easingwold, East Yorkshire, YO21 3BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- BH SBC018	Depth (m) :- 1.50	Sample Type & No :- B6	Specific Depth (m) :- 1.50	Date Tested :- 19/04/2021																																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sieve Size (mm)</th> <th>Passing (%)</th> </tr> </thead> <tbody> <tr><td>75</td><td>100.0</td></tr> <tr><td>63</td><td>80.1</td></tr> <tr><td>50</td><td>80.1</td></tr> <tr><td>37.5</td><td>72.2</td></tr> <tr><td>28</td><td>61.4</td></tr> <tr><td>20</td><td>58.8</td></tr> <tr><td>14</td><td>56.4</td></tr> <tr><td>10</td><td>54.3</td></tr> <tr><td>6.3</td><td>51.2</td></tr> <tr><td>5</td><td>48.4</td></tr> <tr><td>3.35</td><td>45.9</td></tr> <tr><td>2</td><td>43.3</td></tr> <tr><td>1.18</td><td>41.4</td></tr> <tr><td>0.6</td><td>39.6</td></tr> <tr><td>0.425</td><td>38.7</td></tr> <tr><td>0.3</td><td>37.3</td></tr> <tr><td>0.212</td><td>35.1</td></tr> <tr><td>0.15</td><td>31.9</td></tr> <tr><td>0.063</td><td>24.8</td></tr> <tr><td>0.02</td><td>20.6</td></tr> <tr><td>0.006</td><td>14.3</td></tr> <tr><td>0.002</td><td>10.3</td></tr> </tbody> </table>					Sieve Size (mm)	Passing (%)	75	100.0	63	80.1	50	80.1	37.5	72.2	28	61.4	20	58.8	14	56.4	10	54.3	6.3	51.2	5	48.4	3.35	45.9	2	43.3	1.18	41.4	0.6	39.6	0.425	38.7	0.3	37.3	0.212	35.1	0.15	31.9	0.063	24.8	0.02	20.6	0.006	14.3	0.002	10.3
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For description of sample please refer to the Laboratory Sample Description Sheet																																																		
Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC018/B6/1.50	Signed 		Name :- [Redacted]																																														
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		Page 1 of 1																																														



1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Staffs Hill Industrial Estate, Palfrey Fold, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- BH SBC019	Depth (m) :- 3.50	Sample Type & No :- B14	Specific Depth (m) :- 3.50	Date Tested :- 04/05/2021																																																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sieve Size (mm)</th> <th>Passing (%)</th> </tr> </thead> <tbody> <tr><td>28</td><td>100.0</td></tr> <tr><td>20</td><td>99.4</td></tr> <tr><td>14</td><td>98.3</td></tr> <tr><td>10</td><td>97.1</td></tr> <tr><td>6.3</td><td>95.2</td></tr> <tr><td>5</td><td>92.8</td></tr> <tr><td>3.35</td><td>89.9</td></tr> <tr><td>2</td><td>86.8</td></tr> <tr><td>1.18</td><td>84.1</td></tr> <tr><td>0.6</td><td>80.8</td></tr> <tr><td>0.425</td><td>79.4</td></tr> <tr><td>0.3</td><td>76.9</td></tr> <tr><td>0.212</td><td>70.0</td></tr> <tr><td>0.15</td><td>66.3</td></tr> <tr><td>0.063</td><td>58.8</td></tr> <tr><td>0.02</td><td>52.0</td></tr> <tr><td>0.006</td><td>39.3</td></tr> <tr><td>0.002</td><td>29.7</td></tr> </tbody> </table>					Sieve Size (mm)	Passing (%)	28	100.0	20	99.4	14	98.3	10	97.1	6.3	95.2	5	92.8	3.35	89.9	2	86.8	1.18	84.1	0.6	80.8	0.425	79.4	0.3	76.9	0.212	70.0	0.15	66.3	0.063	58.8	0.02	52.0	0.006	39.3	0.002	29.7																																																																																																																				
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CLAY		SAND			GRAVEL			BOULDERS																																																																																																																																																						
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Date of issue :- 24/05/2021	Certificate No :- PSD/4322A/BH SBC019/B14/3.50	Signed :- [Redacted]	Name :- [Redacted]	Page 1 of 1																																																																																																																																																										
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9																																																																																																																																																													



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 26 Skala Gill Industrial Estate, Felling Park, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

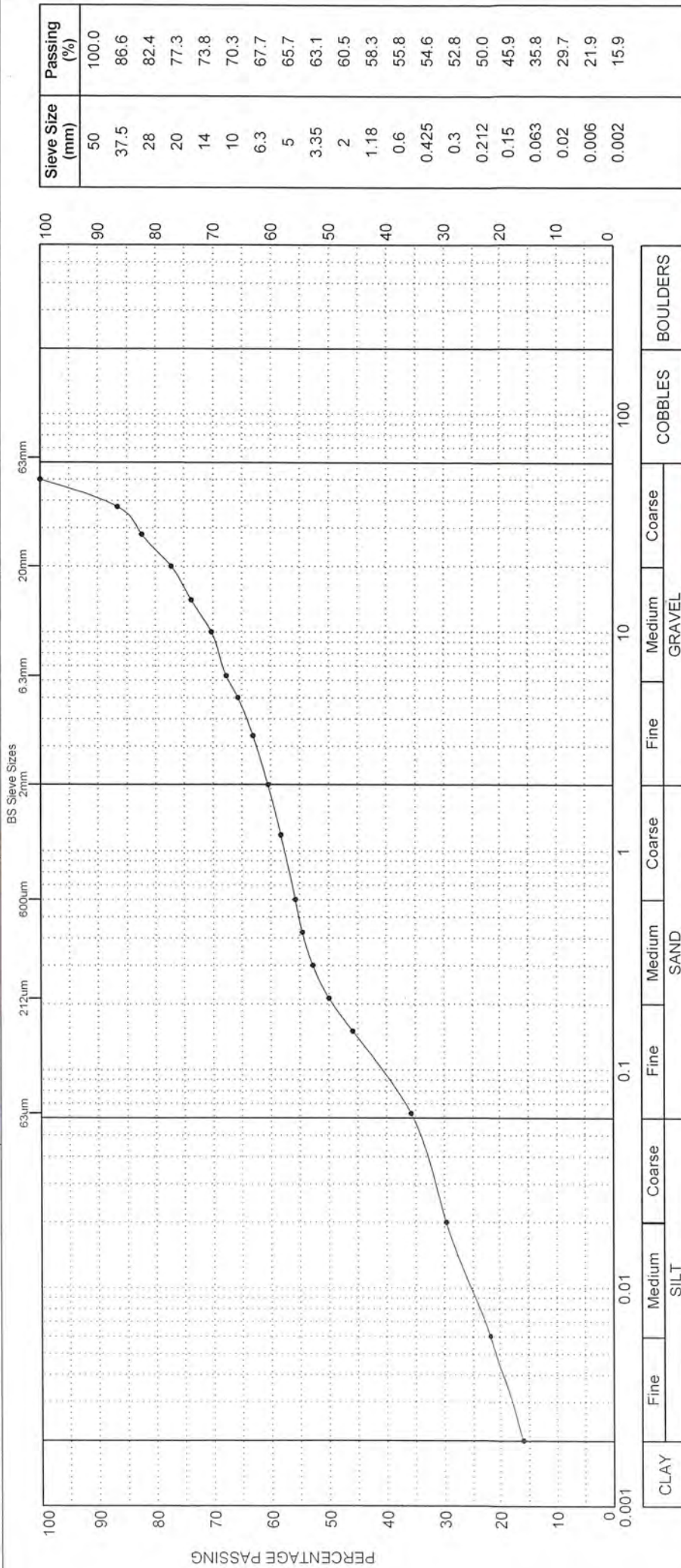
Exploratory Hole No :- BH SBC020

Depth (m) :- 4.00

Sample Type & No :- B17

Specific Depth (m) :- 4.00

Date Tested :- 05/05/2021



For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**

Name: [Redacted] Signed: [Redacted]

Certificate No :- PSD/4322A/BH SBC020/B17/4.00

Date of issue :- 26/05/2021



Client :- AMEY OW Limited

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

AEG Contract No :- 4322A

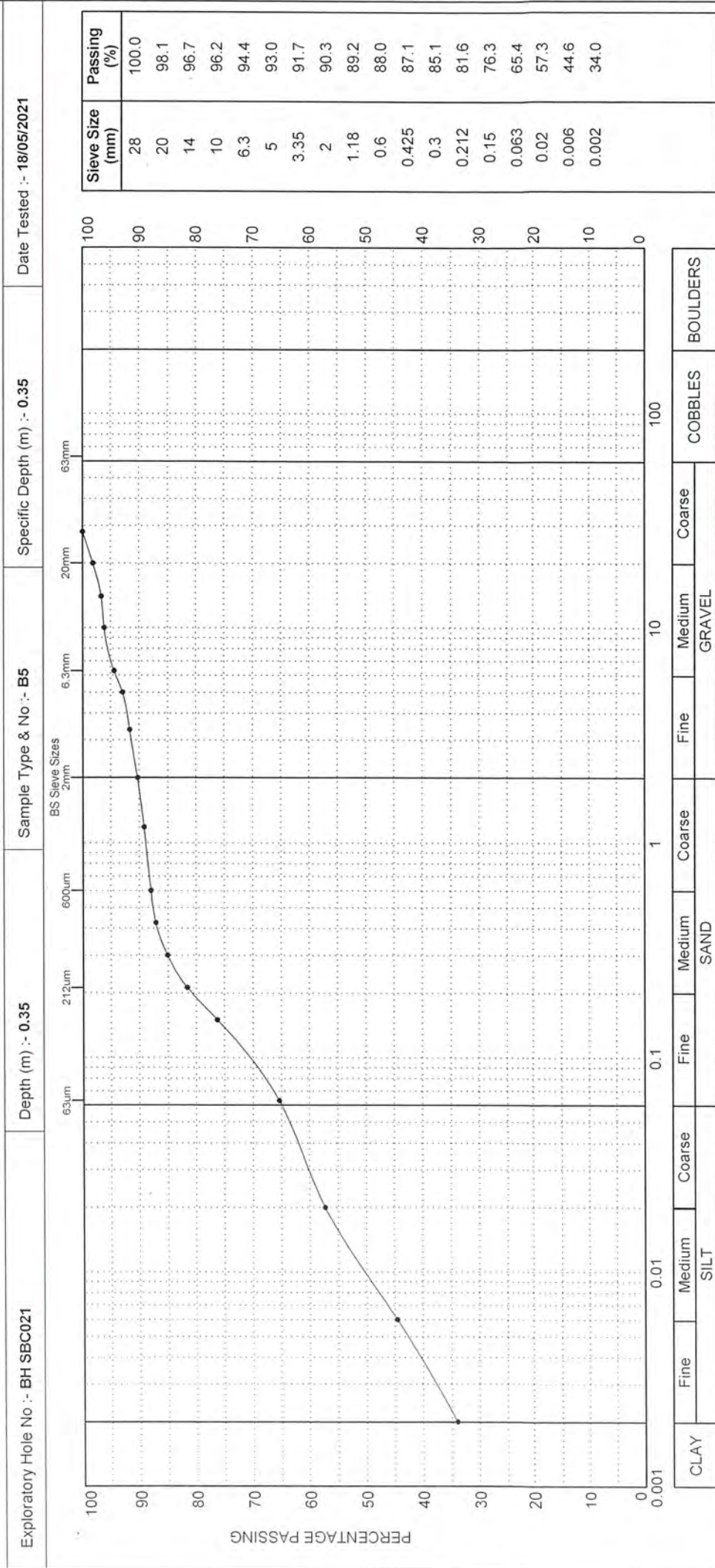


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Etnam Vnart, Blackburn, BB1 5EL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 28/05/2021	Certificate No :- PSD/4322A/BH SBC021/B5/0.35	Signed 	Name :- <b>M. SELKIRK</b>	Page 1 of 1
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		1367

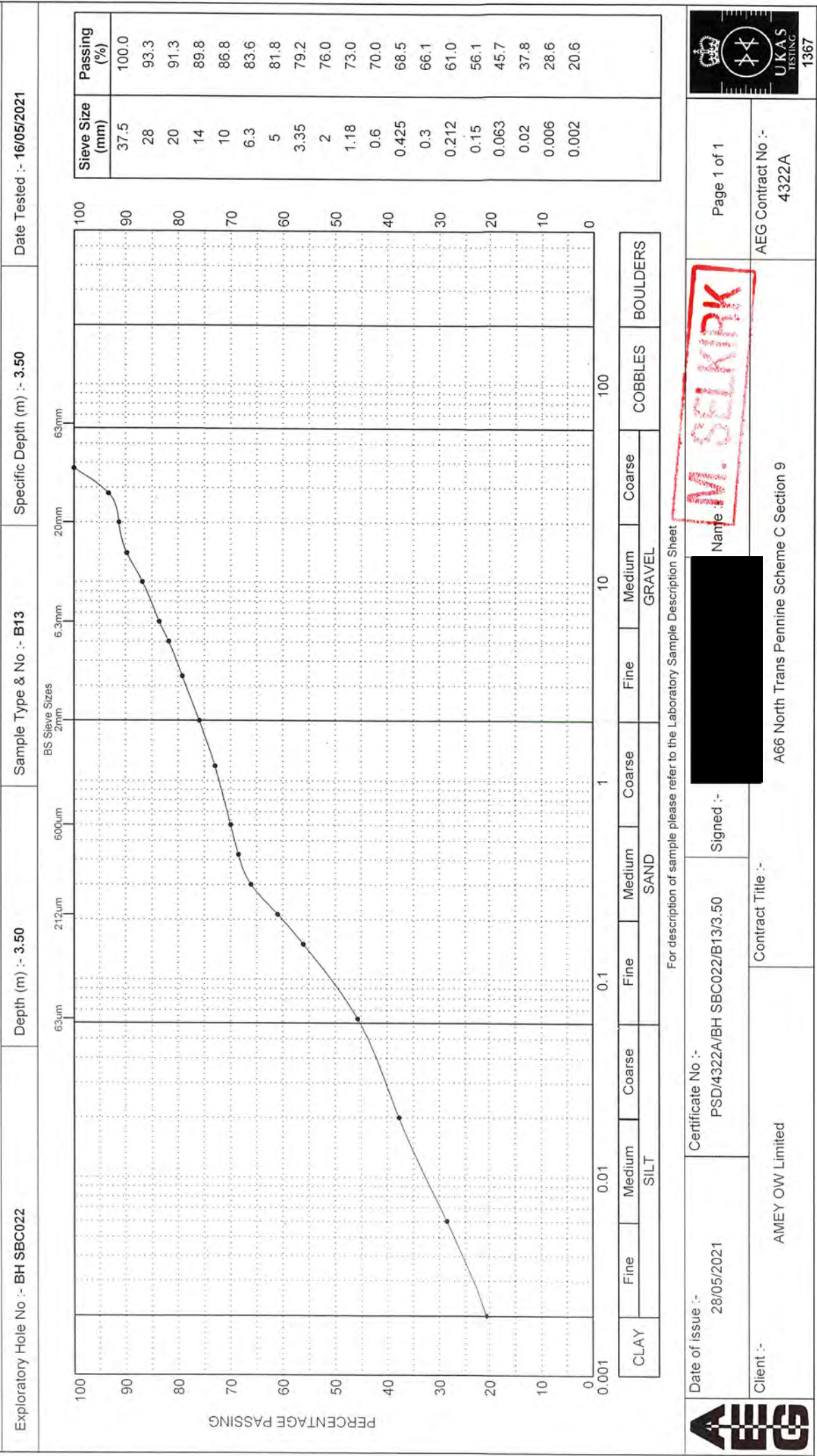


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackbourn, BB1 5BL - Tel: [REDACTED]

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



Exploratory Hole No :- BH SBC022      Depth (m) :- 3.50      Sample Type & No :- B13      Specific Depth (m) :- 3.50      Date Tested :- 16/05/2021

CLAY		SAND			GRAVEL			COBBLES	BOULDERS
Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.002	0.01	0.075	0.075	0.2	0.425	2	6.3	20	63

For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 28/05/2021	Certificate No :- PSDI/4322A/BH SBC022/B13/3.50	Signed :- [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 1 of 1
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		



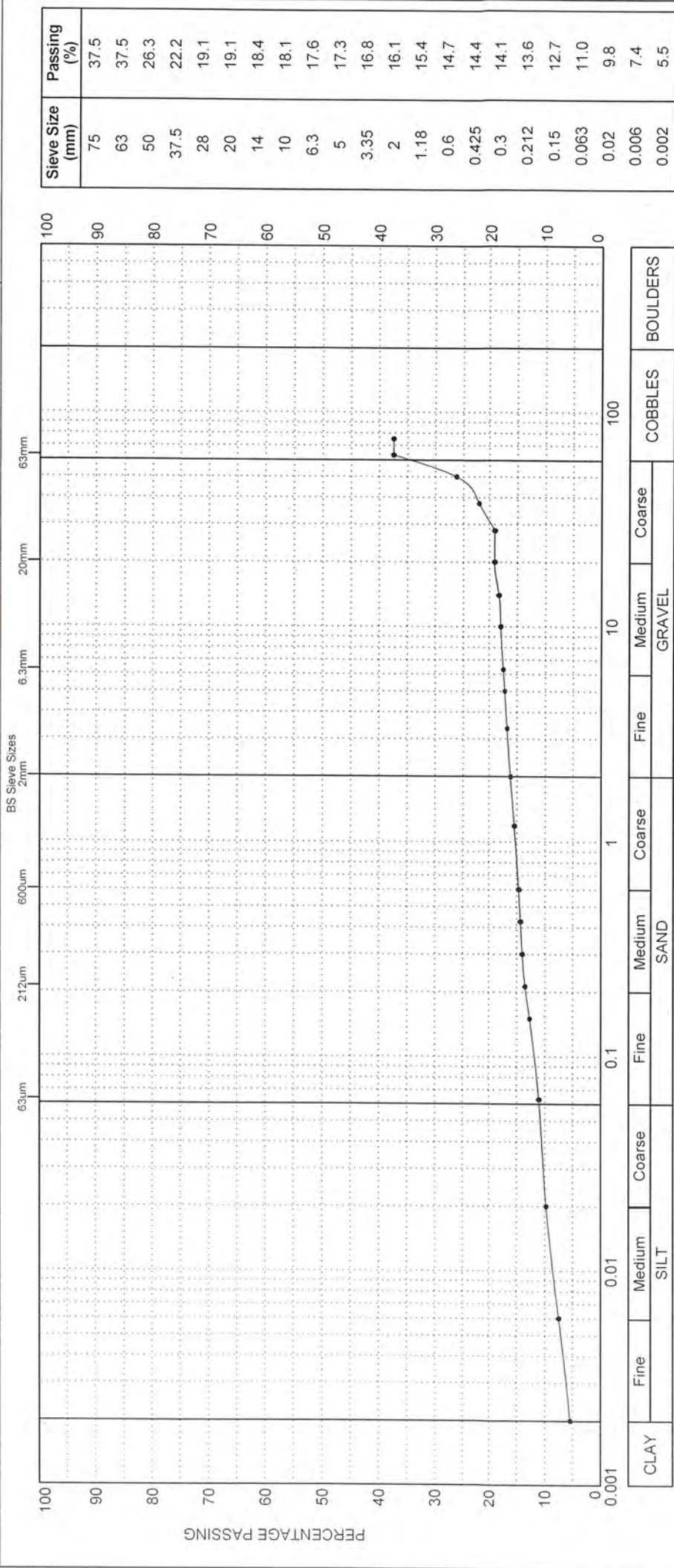
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gull Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG.  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BL, Tel: [REDACTED]

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990  
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- BH SBC023A	Depth (m) :- 8.00	Sample Type & No :- B23	Specific Depth (m) :- 8.00	Date Tested :- 04/05/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/BH SBC023A/B23/8.00	Signed :- [REDACTED]	Name :- [REDACTED]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Page 1 of 1	
		AEG Contract No :- 4322A	



**M. SELKIRK**



1367





Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9

Contract No **A13955**

Client Allied Exploration & Geotechnics Limited

Hole BH SBC024

Engineer

Sample Ref  
 Depth (m) 4.50  
 Sample Type B17

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	93
28.0 mm	91
20.0 mm	88
14.0 mm	87
10.0 mm	86
6.30 mm	83
5.00 mm	81
3.35 mm	79
2.00 mm	76
1.18 mm	73
630 µm	71
425 µm	69
300 µm	67
200 µm	63
150 µm	56
63 µm	47
20 µm	25
6 µm	18
2 µm	8

**Non Engineering Description**

Brown clayey garvelly very sandy SILT. Gravel is fine to coarse

**Sample Proportions - %**

Cobbles	0.0
Gravel	24.0
Sand	30.6
Silt	37.8
Clay	7.6

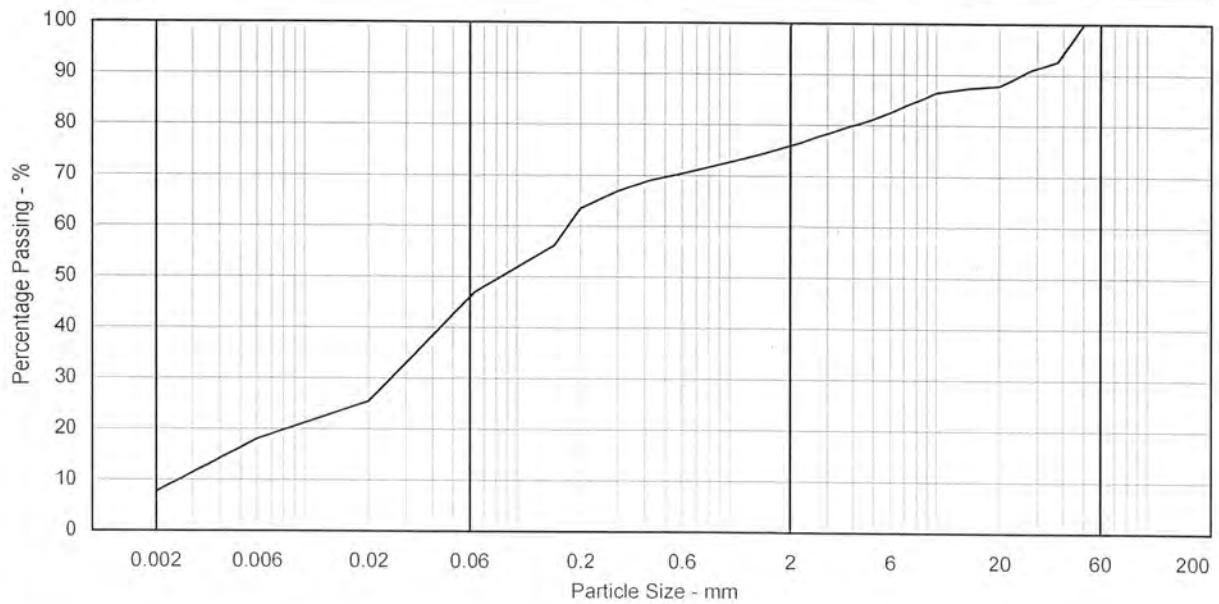
**Particle Diameter - mm**

D100	50
D60	0.17
D10	0.0026
Uniformity Coefficient <small>(SHW series 600, Table 6/1, footnote 5)</small>	65.4

**Notes**

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved
DW	[Redacted]
	01/06/2021

**PARTICLE SIZE DISTRIBUTION**

BS EN ISO 17892-4 2016 Clause 5.2 - Sieving Method  
 BS EN ISO 17892-4 2016 Clause 5.4 - Pipette Method

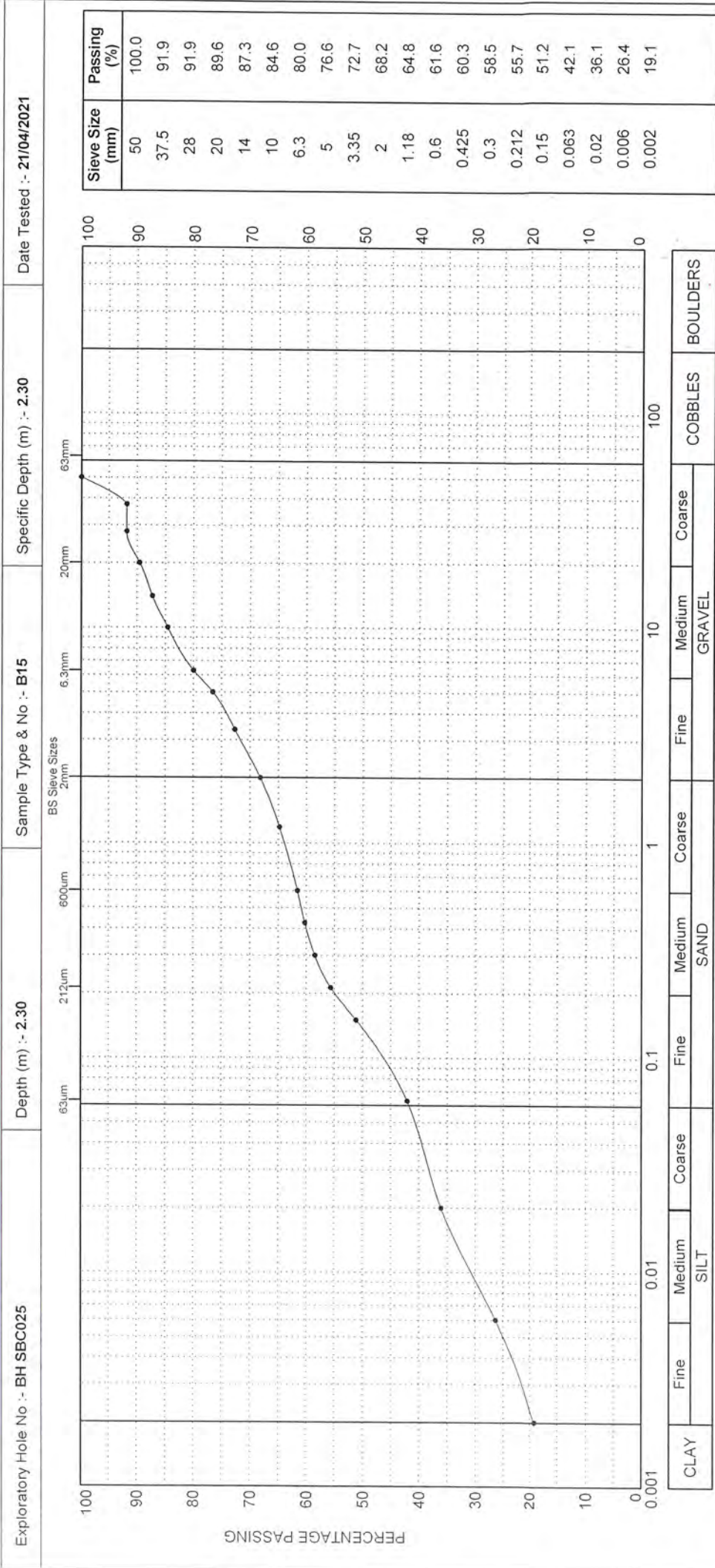


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5F

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/BH SBC025/B15/2.30	Sign	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1

UKAS TESTING 1367



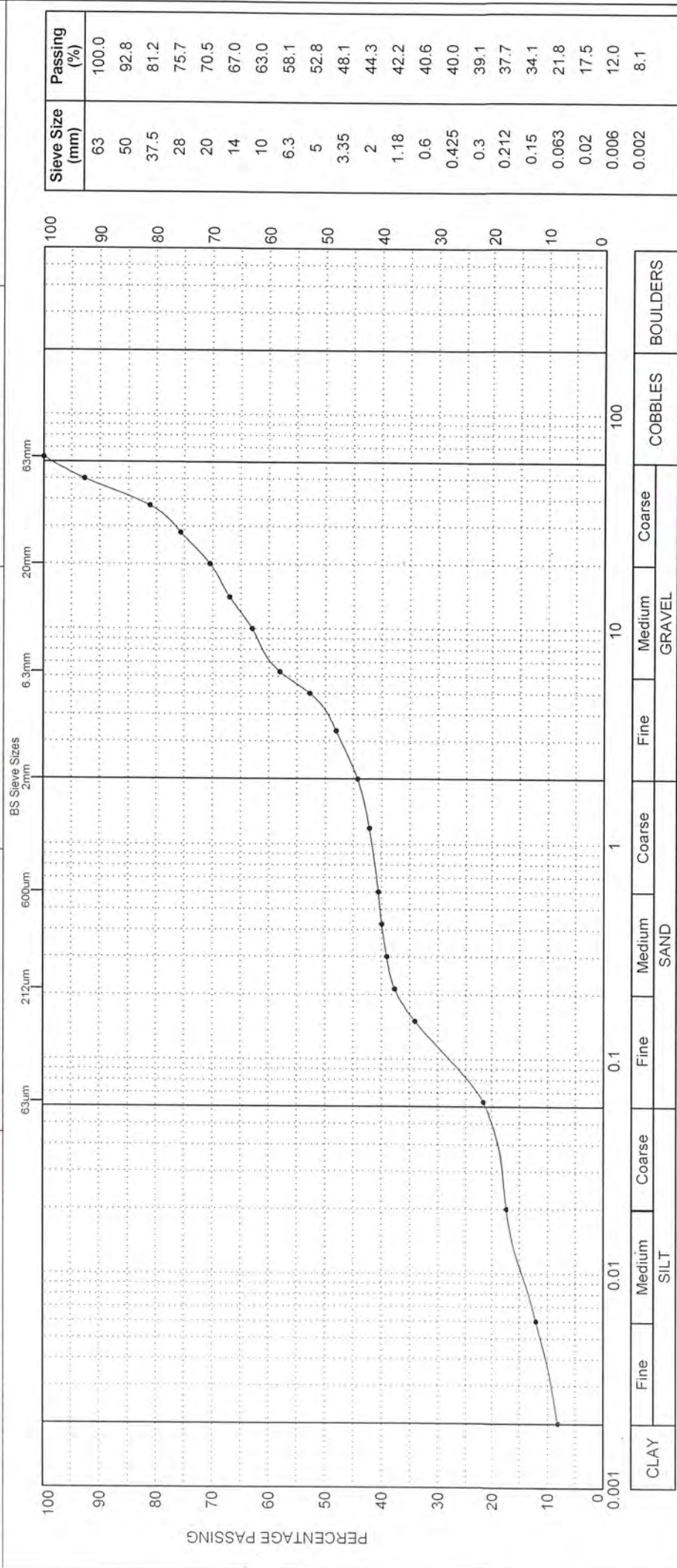
# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Stella Gill Industrial Estate, Peabon Fold, Chester-le-Street, Co. Durham, DL10 1JF  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990  
 (Test deviated from standard due to insufficient sample mass)

Exploratory Hole No. :- BH SBC026	Depth (m) :- 2.85	Sample Type & No. :- B13	Specific Depth (m) :- 2.85	Date Tested :- 18/05/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 28/05/2021	Certificate No. :- PSD/4322A/BH SBC026/B13/2.85	Signature	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A	

Page 1 of 1

AMEY OW Limited

M. SELKIRK

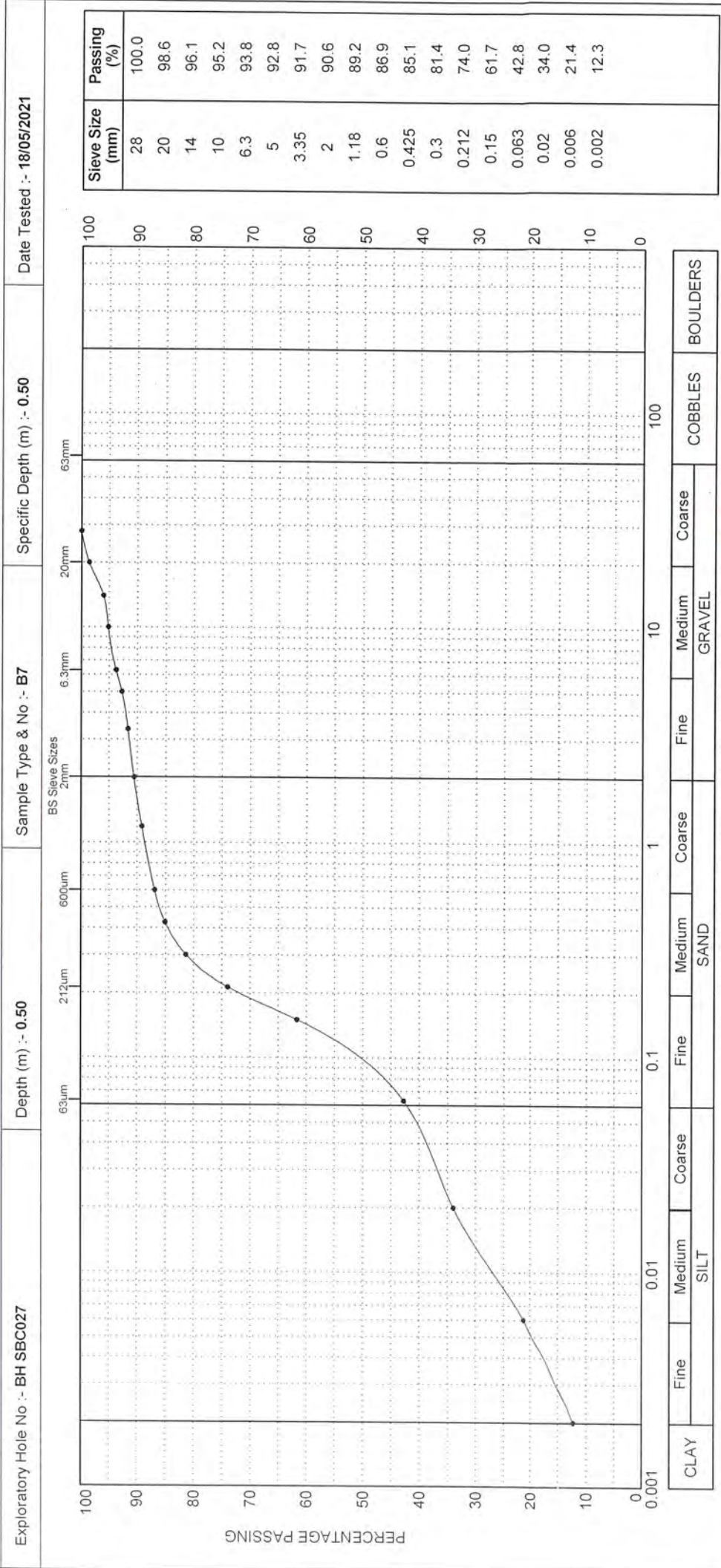
UKAS TESTING 1367

# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Padiham, Chorley, Lancashire, PR10 0JH  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 9

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 28/05/2021	Certificate No :- PSD/4322A/BH SBC027/B7/0.50	Name [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Signature [Redacted]	AEG Contract No :- 4322A



**M. SELKIRK**



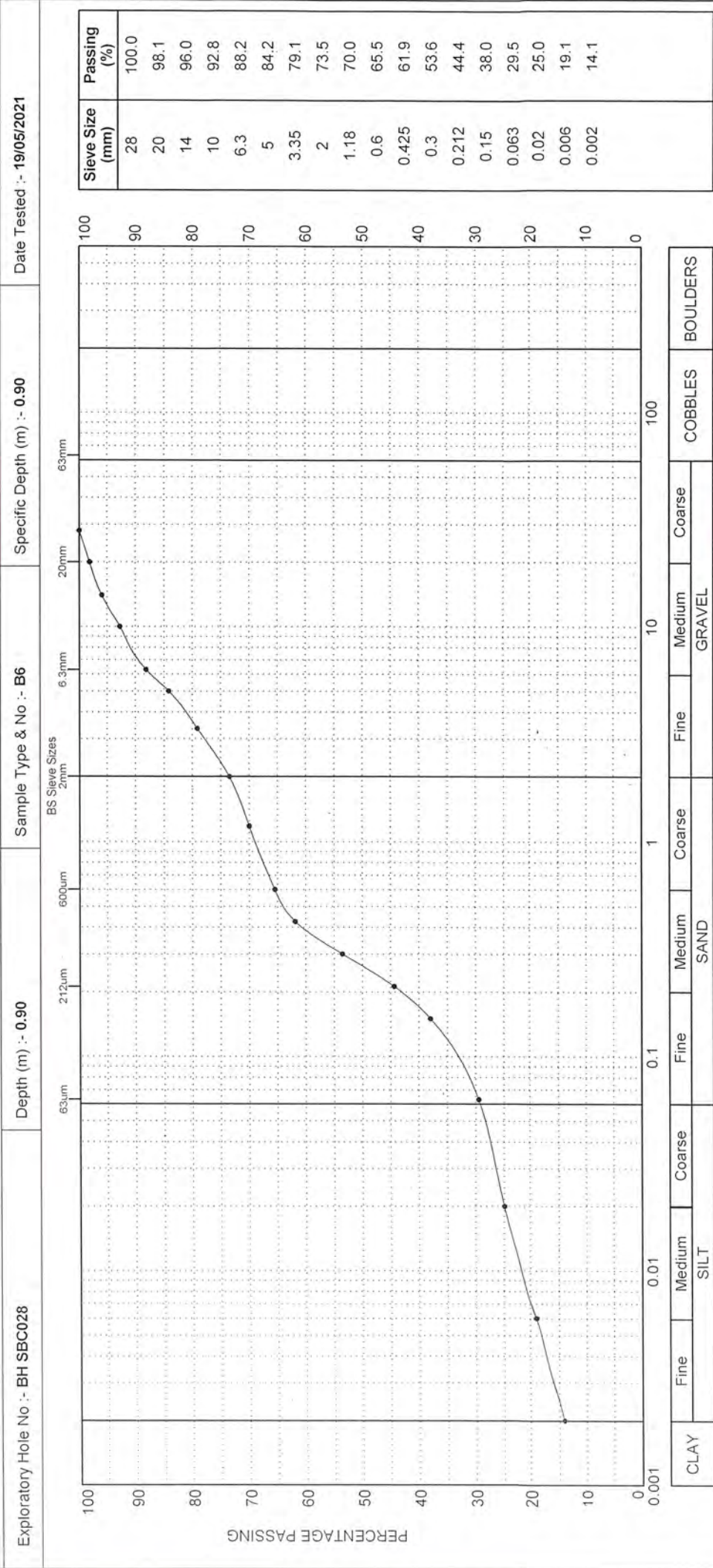


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Off Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH4  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 28/05/2021	Certificate No :- PSD/4322A/BH SBC028/B6/0.90	Sign	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	
		Page 1 of 1	



# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25, Stella Court Industrial Estate, Peckers Hill, Chester, Cheshire, CH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- BH SBC029	Depth (m) :- 0.20	Sample Type & No :- J2	Specific Depth (m) :- 0.20	Date Tested :- 22/04/2021
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Sieve Size (mm)	Percentage Passing (%)
0.075	100
0.15	95.8
0.3	91.8
0.6	81.0
1.2	54.8
2.5	45.2
5.0	31.0
10.0	19.6

Sieve Size (mm)	Passing (%)
2	95.8
0.6	91.8
0.212	81.0
0.063	54.8
0.02	45.2
0.006	31.0
0.002	19.6

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SAND			GRAVEL							

Date of issue :- 30/04/2021

Certificate No :- PSD/4322A/BH SBC029/J2/0.20

Client :- AMEY OW Limited

Signature :- [Redacted]

Name :- **M. SELKIRK**

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Contract No :- 4322A

For description of sample please refer to the Laboratory Sample Description Sheet

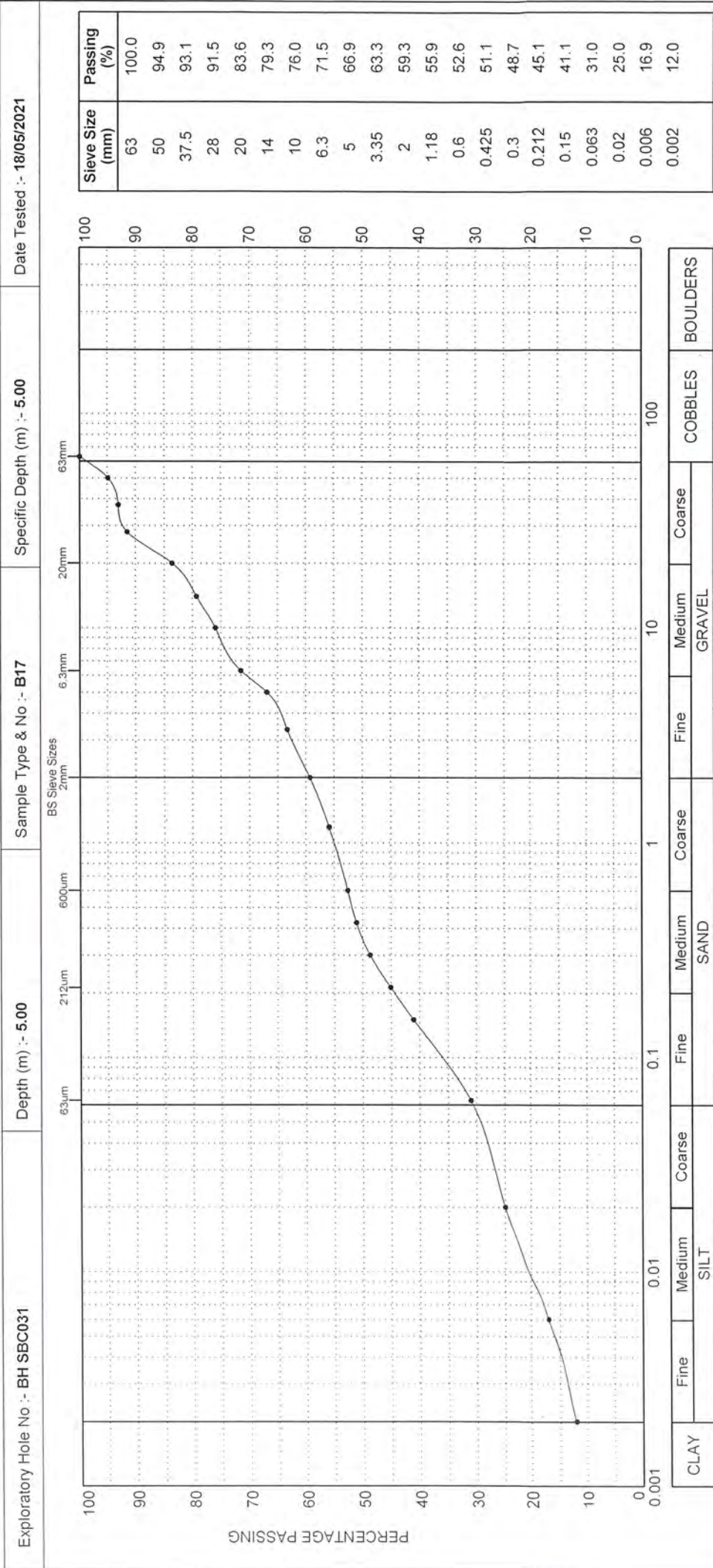


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Court Industrial Estate, Peirson Hall, Cheselate Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eastham Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/BH SBC031/B17/5.00	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	<b>M. SELKIRK</b>	
		AEG Contract No :- 4322A	

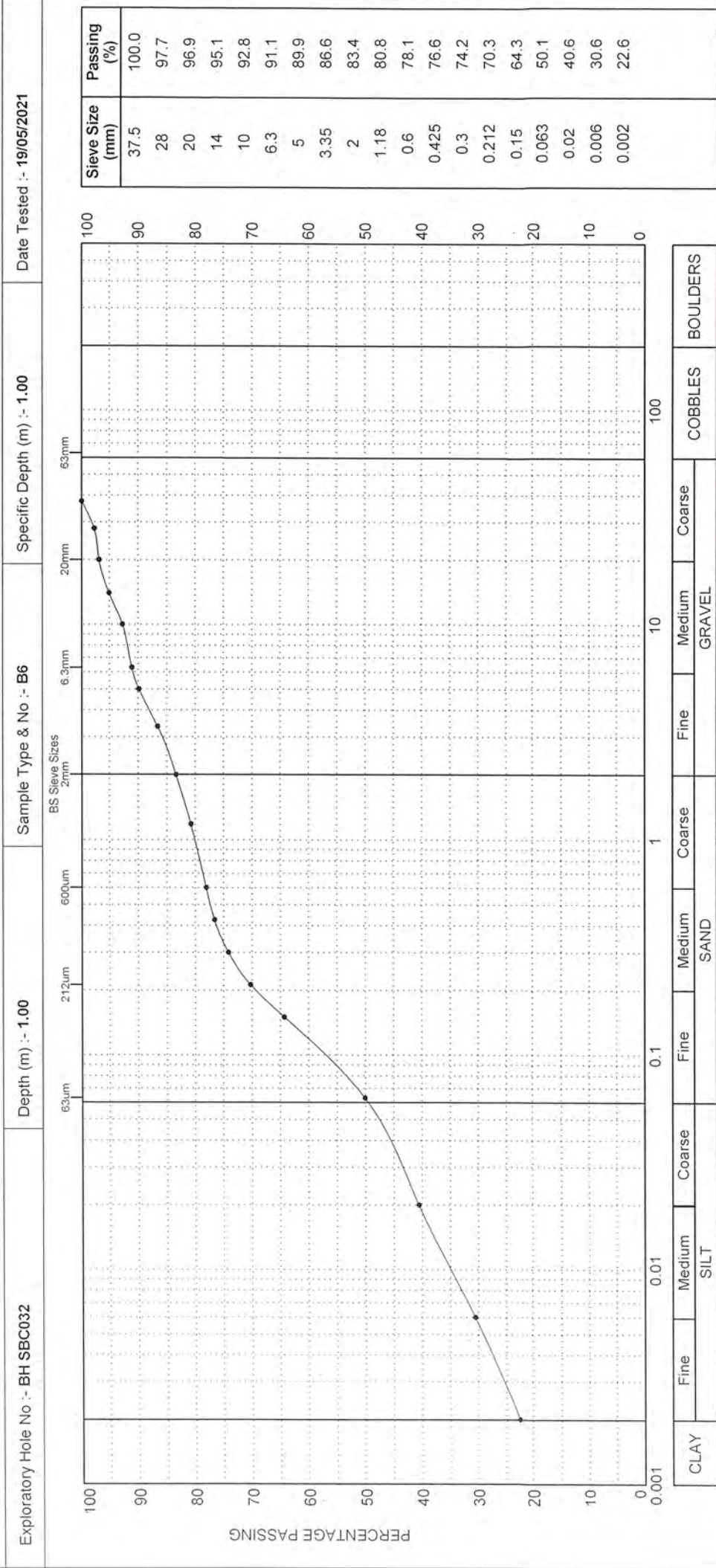


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Industrial Estate, Pelton Rd, Chester Street, Durham, DH1  
Regional Office: Unit 20 Business Development Centre, Easton Wharf, Blaydon, BB1 5BB

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**  
Name :-



Date of issue :- 28/05/2021	Certificate No :- PSD/4322A/BH SBC032/B6/1.00	Signature :- [Redacted]	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		



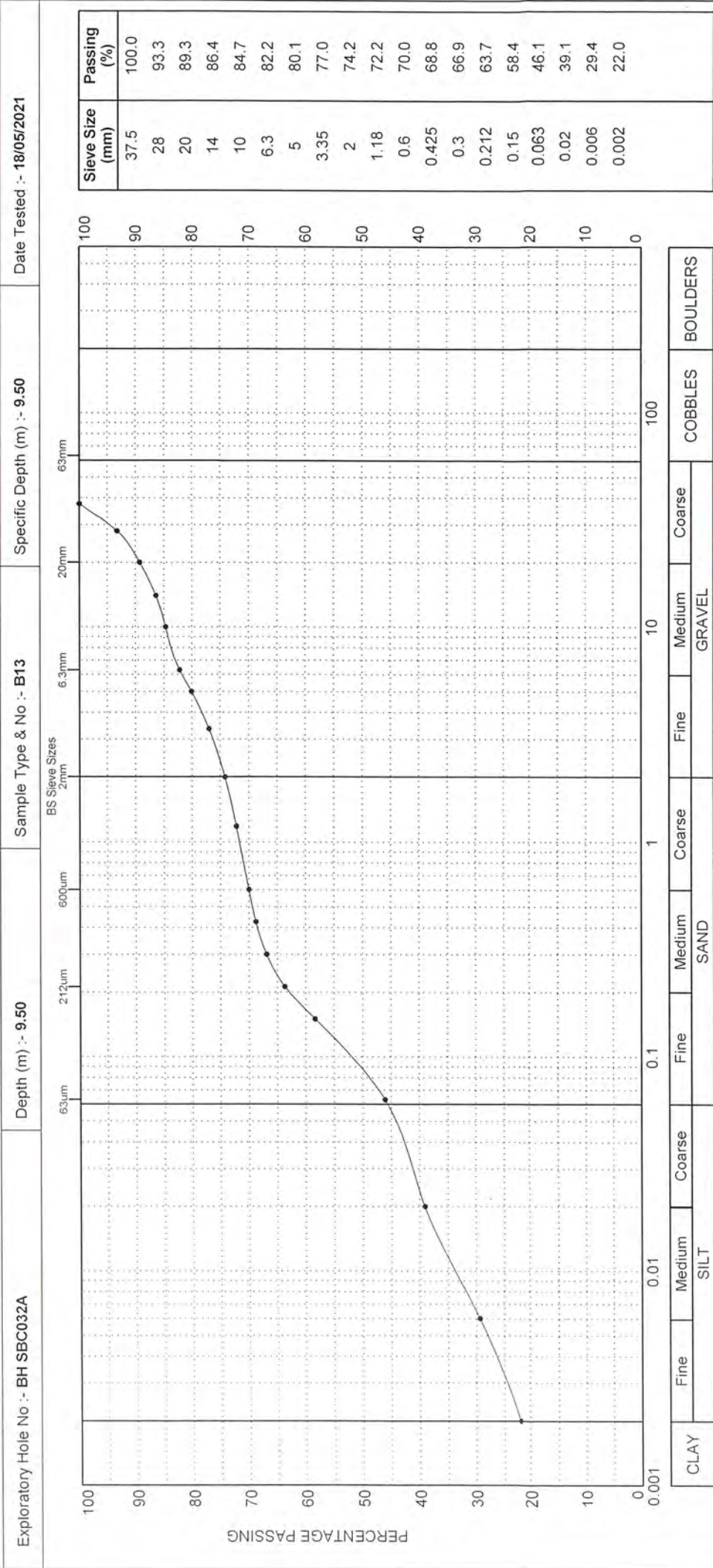


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Oil Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1  
Regional Office: Unit 20, Business Development Centre, Eastam Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/BH SBC032A/B13/9.50	Sign	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Hill Industrial Estate, Pulton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Ennism Wharf, Blackburn, BB1 5RU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

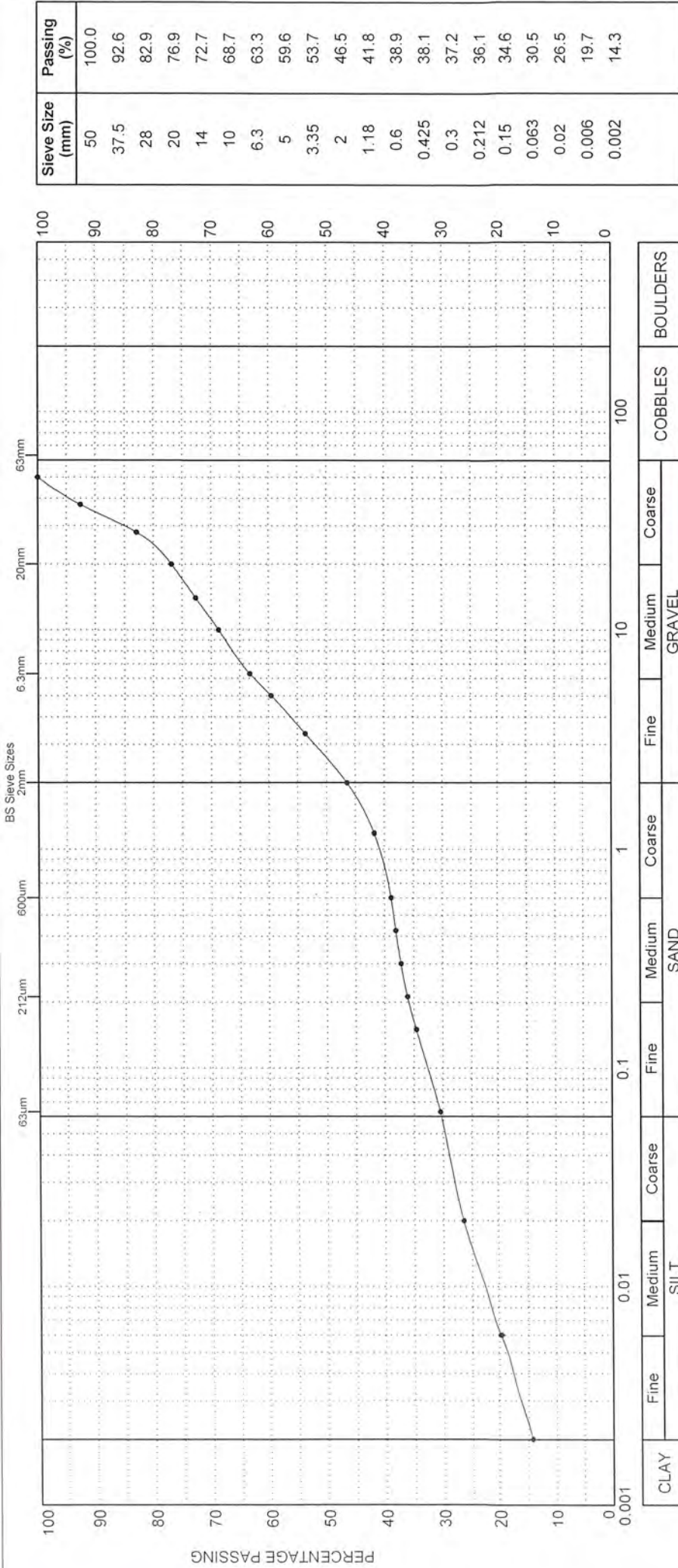
Exploratory Hole No :- TP SBC001

Depth (m) :- 1.00

Sample Type & No :- B4

Specific Depth (m) :- 1.00

Date Tested :- 04/05/2021



For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**



Page 1 of 1  
AEG Contract No :- 4322A

Name :- [Redacted]  
A66 North Trans Pennine Scheme C Section 9

Certificate No :- PSD/4322A/TP SBC001/B4/1.00

Date of issue :- 27/05/2021

Client :- AMEY OW Limited

Contract Title :-

Sign :- [Redacted]

AMEY OW Limited



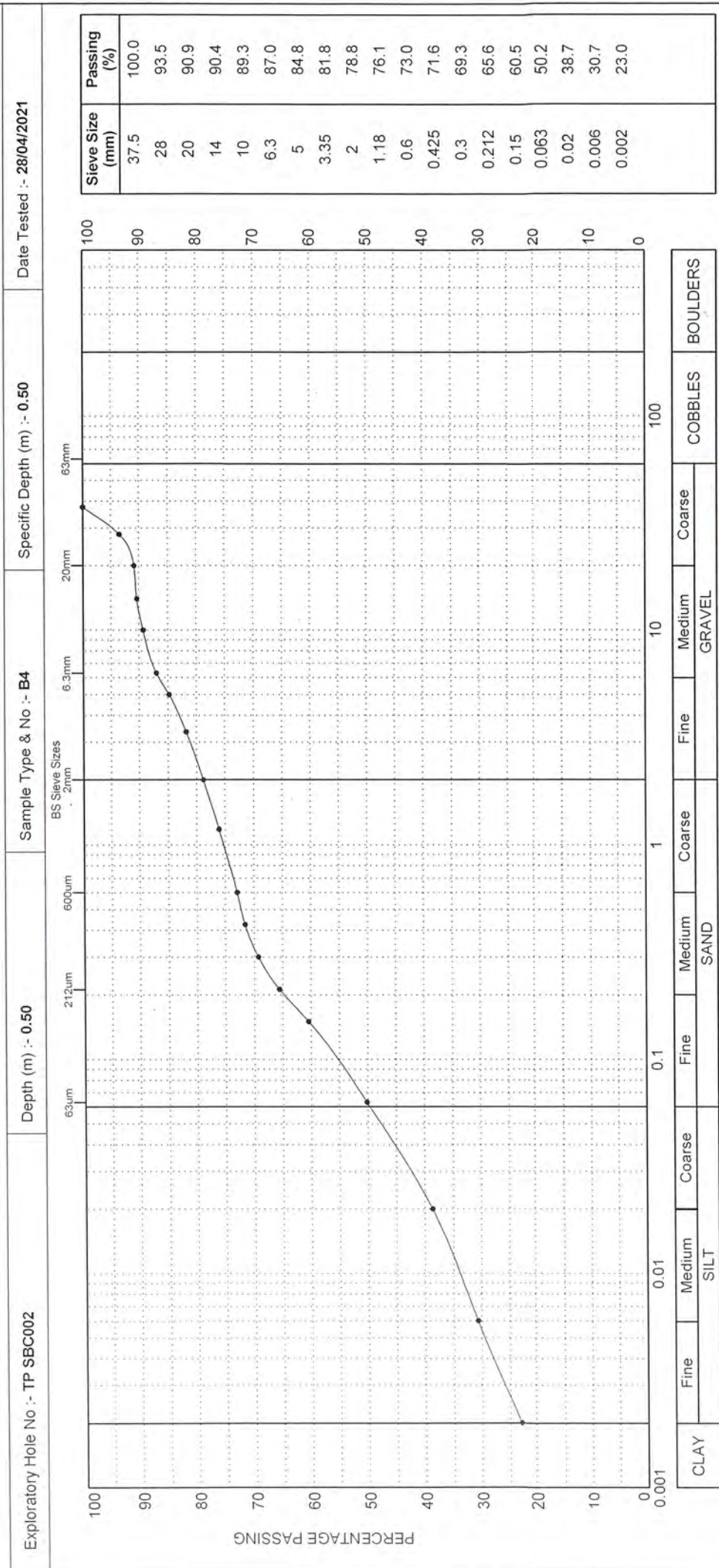


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Stella, Gill Industrial Estate, Patton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC002/B4/0.50	Signature	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1

1367



**M. SELKIRK**

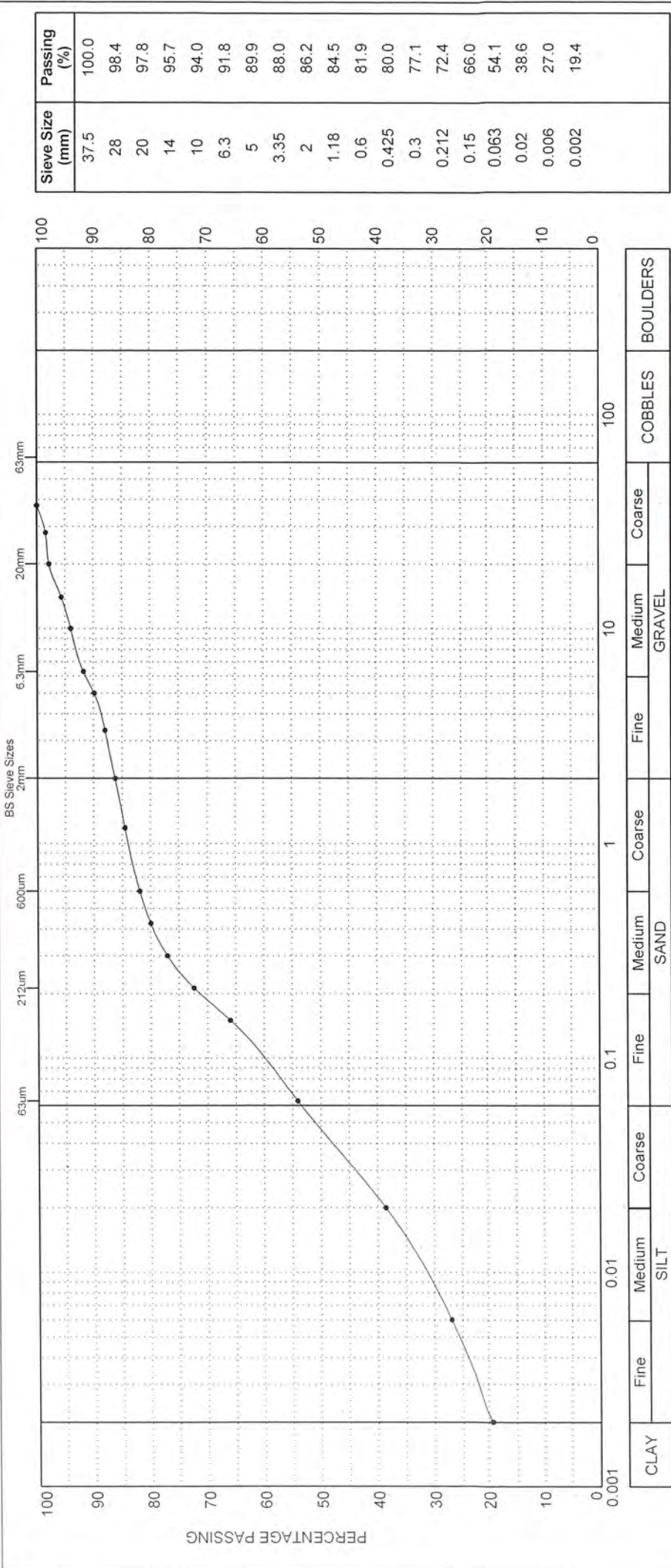
# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25, Stella Court Industrial Estate, Pelford Hall, Cheshire, Street, Co. Durham, DH3 1JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC003	Depth (m) :- 1.50	Sample Type & No :- B7	Specific Depth (m) :- 1.50	Date Tested :- 29/04/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC003/B7/1.50	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

1367



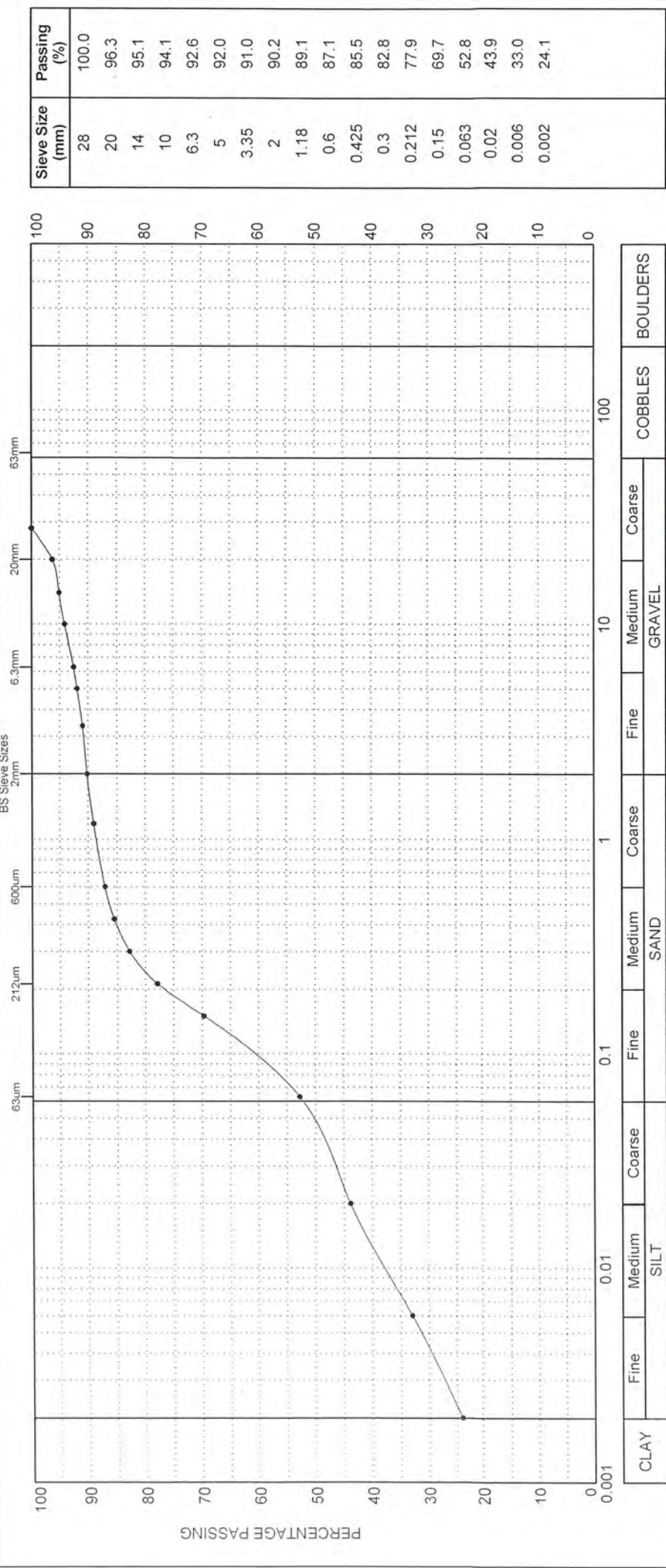
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Hill Industrial Estate, Pelling Field, Chester-le-Street, Co. Durham, DH2 1JL  
Regional Office: Unit 23, Business Development Centre, Easton Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC004	Depth (m) :- 0.50	Sample Type & No :- B3	Specific Depth (m) :- 0.50	Date Tested :- 19/04/2021
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**AMEY**

Date of issue :- 30/04/2021

Certificate No :- PSD/4322A/TP SBC004/B3/0.50

Client :- AMEY OW Limited

**UKAS TESTING**  
1367

Page 1 of 1

AEG Contract No :- 4322A

For description of sample please refer to the Laboratory Sample Description Sheet

Name :- **M. SELKIRK**

Signature :- [Redacted]

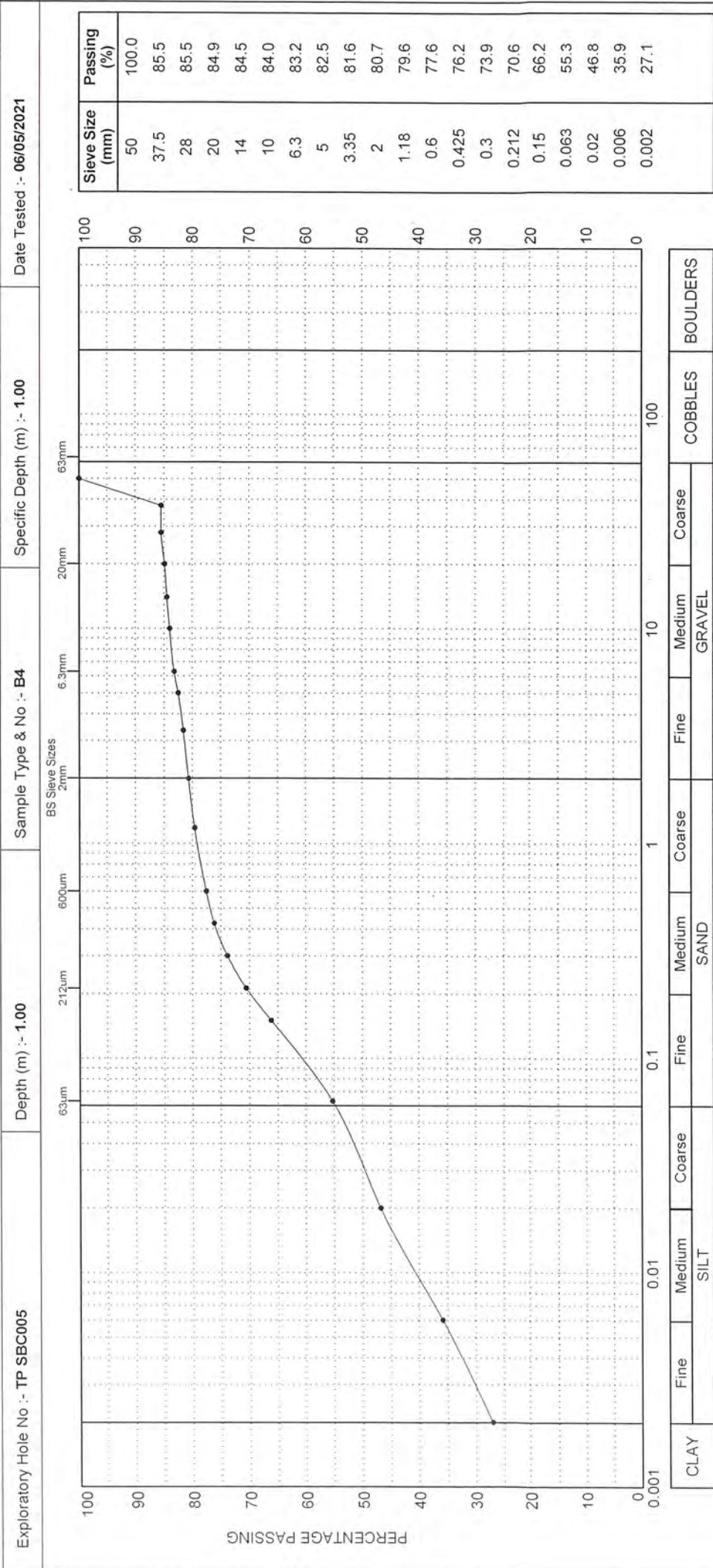
Contract Title :- A66 North Trans Pennine Scheme C Section 9

# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25, Salford City Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



**AMEY**

Date of issue :- 26/05/2021

Certificate No :- PSD/4322A/TP SBC005/B4/1.00

Client :- AMEY OW Limited

Signature: [Redacted]

Name :- **M. SELKIRK**

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Contract No :- 4322A

For description of sample please refer to the Laboratory Sample Description Sheet

Page 1 of 1

UKAS TESTING 1367

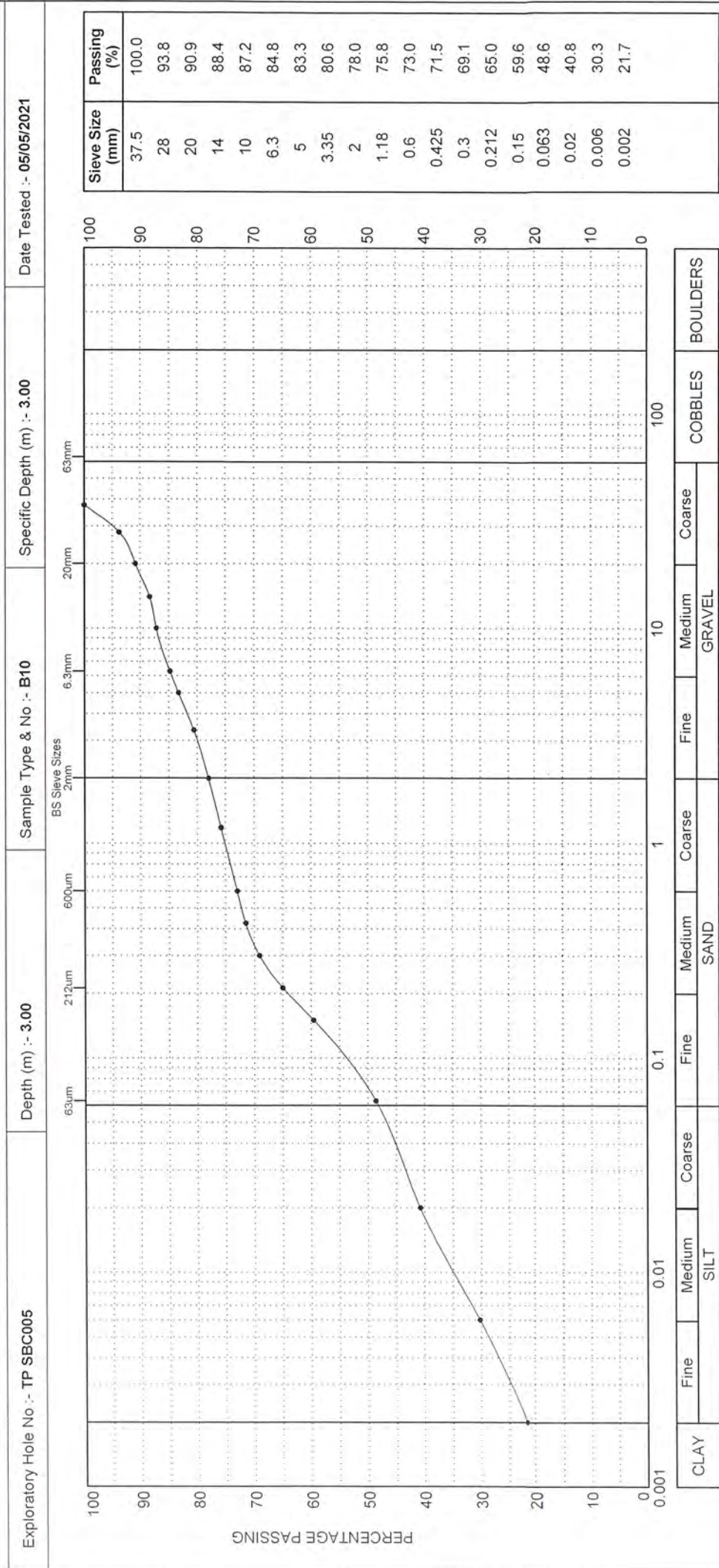


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easingwold, East Yorkshire, YO21 2JL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

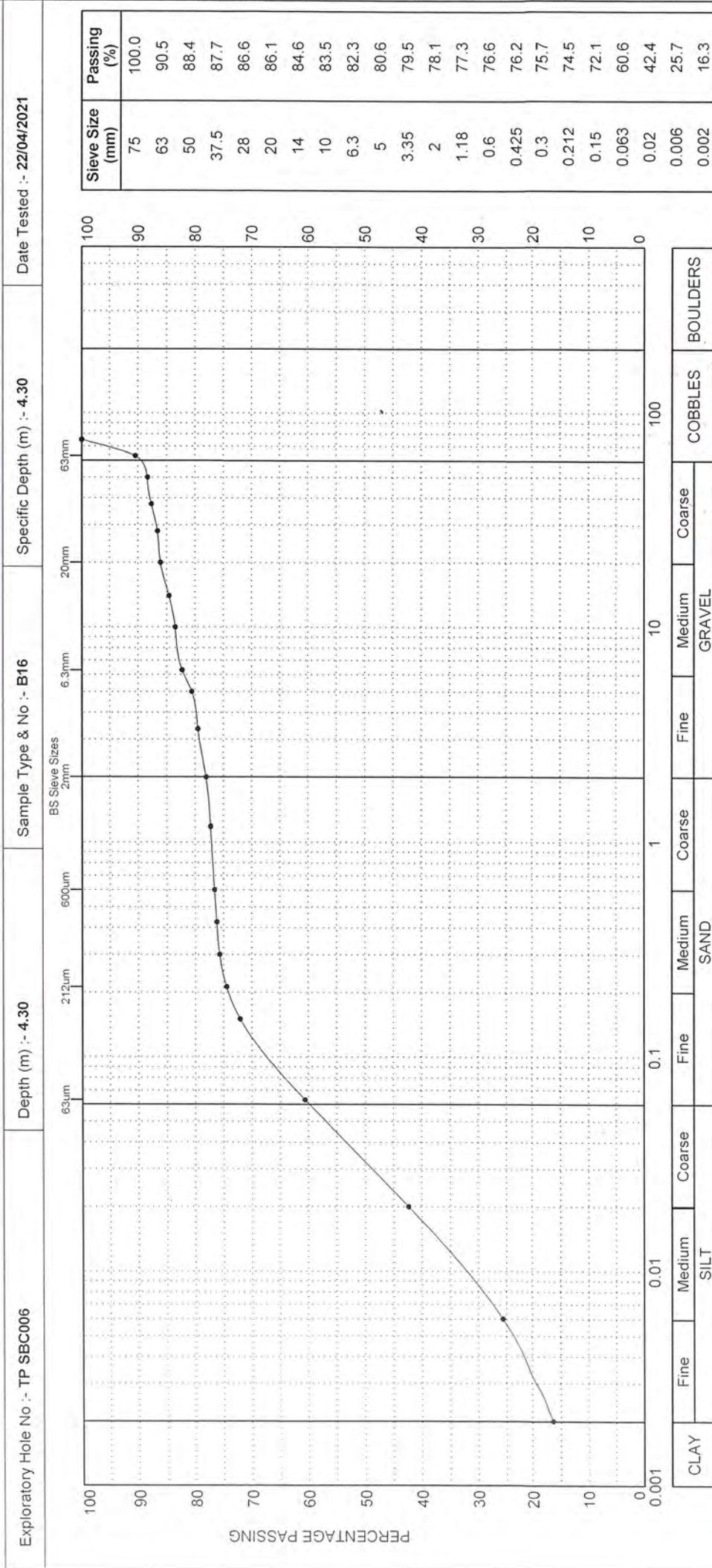
Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC005/B10/3.00	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :-	AEG Contract No :- 4322A	

# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Pailton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**  
Name :-



Page 1 of 1  
AEG Contract No :- 4322A

Date of issue :- 17/05/2021  
Certificate No :- PSD/4322A/TP SBC006/B16/4.30  
Client :- AMEY OW Limited  
Contract Title :- A66 North Trans Pennine Scheme C Section 9



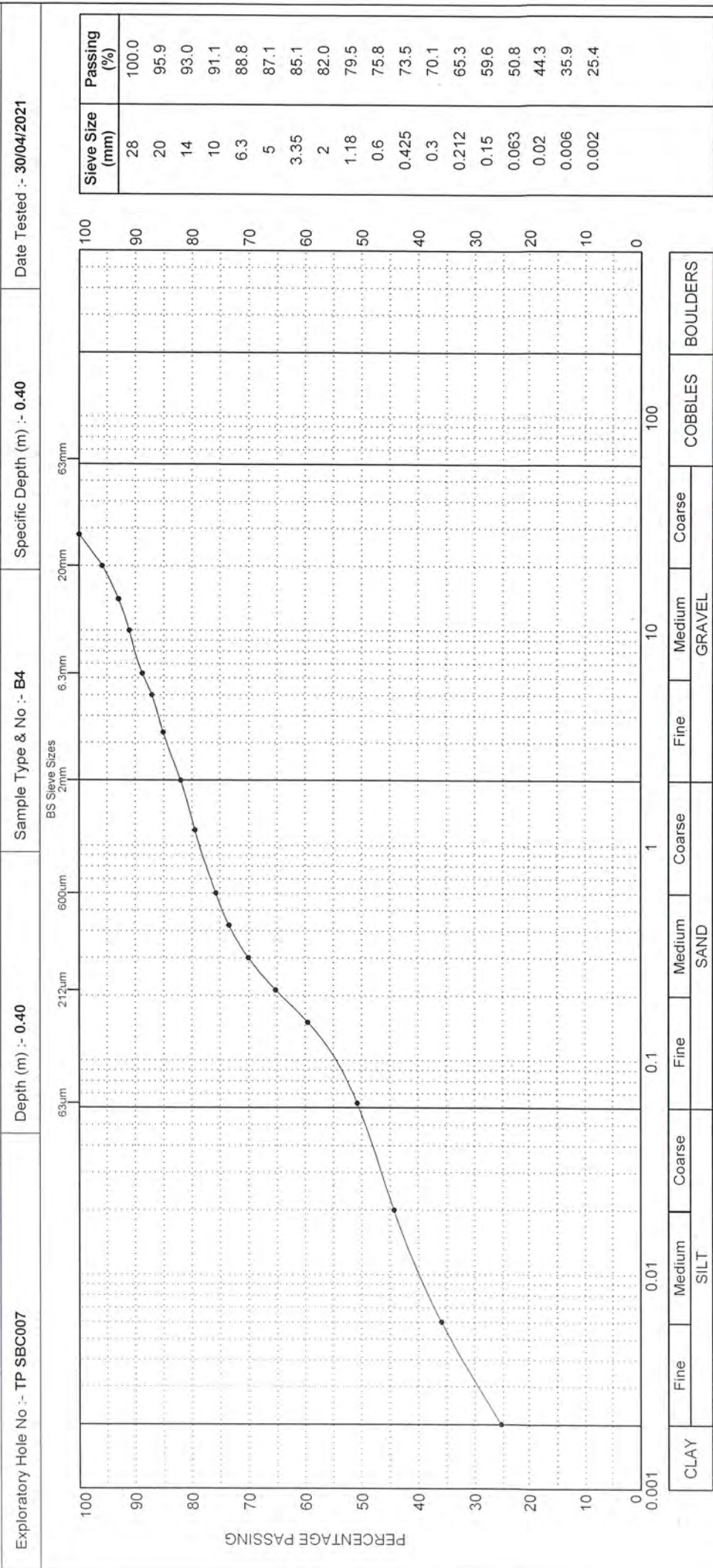


# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25, Staffs, Gill Industrial Estate, Pelford, Staffs, Chester, Cheshire, Co. Durham, DL42  
Regional Office: Unit 20, Business Development Centre, Easingwold, East Yorkshire, YO21 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC007/B4/0.40	Signature :- [Redacted]	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1

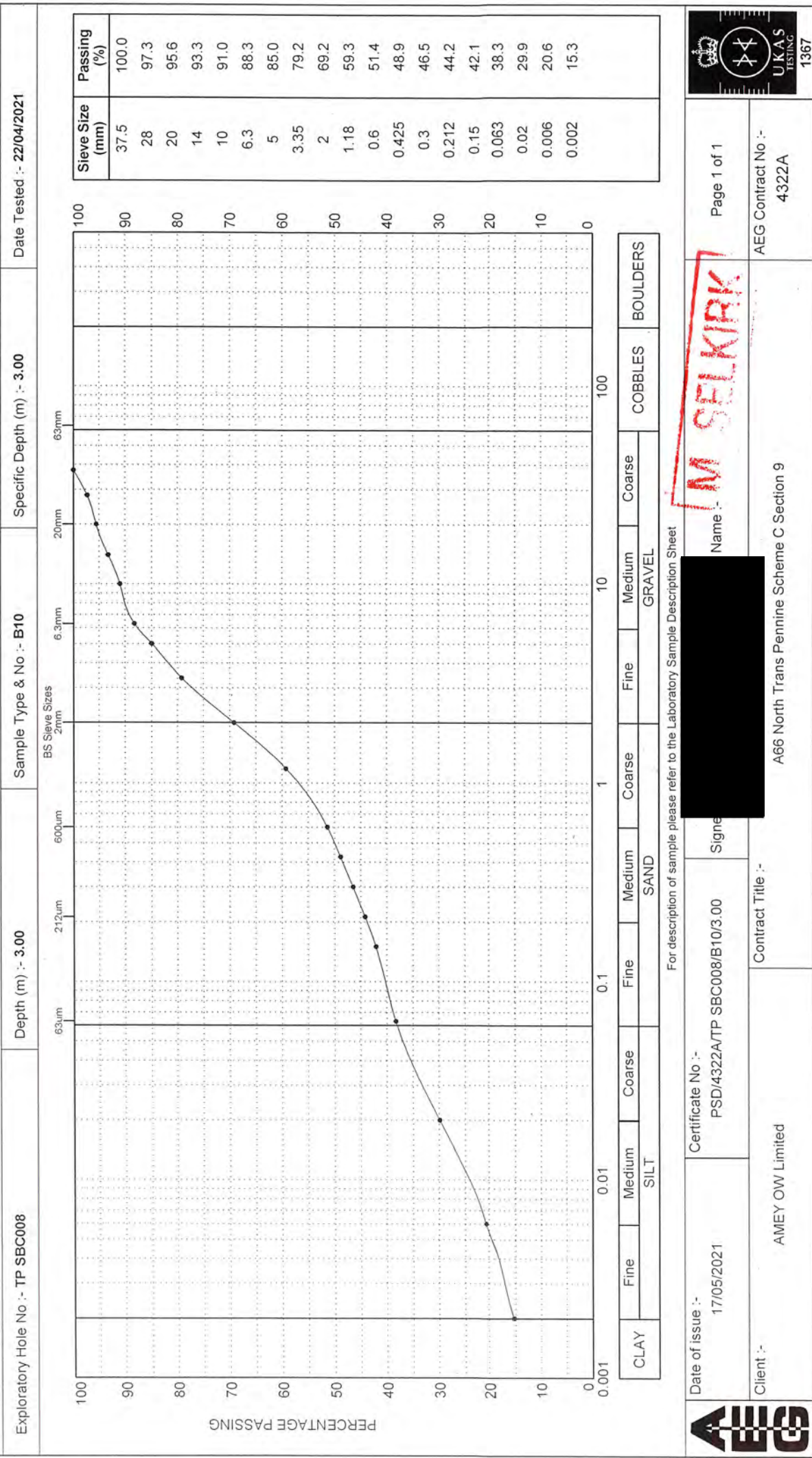


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella, Call Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blaxburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

<b>AEG</b> Date of issue : 17/05/2021 Certificate No :- PSD/4322A/TP SBC008/B10/3.00 Client :- AMEY OW Limited	Signature [Redacted]	Name :- [Redacted] <b>M SELKIRK</b>	Page 1 of 1
			Contract Title :- A66 North Trans Pennine Scheme C Section 9 AEG Contract No :- 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

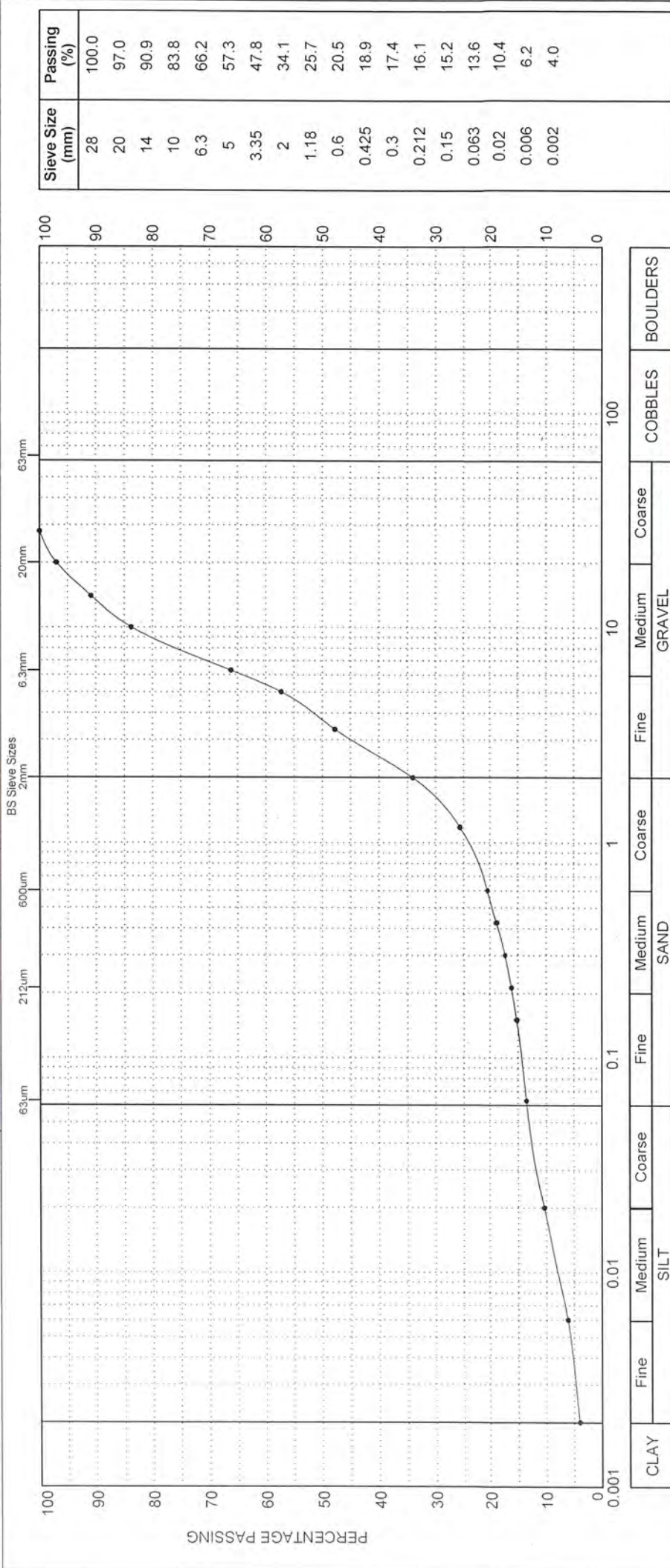
Head Office: Unit 25 Stella Cell Industrial Estate, Pelton Fell, Chesdale Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- TP SBC008	Depth (m) :- 4.00	Sample Type & No :- B12	Specific Depth (m) :- 4.00	Date Tested :- 28/04/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC008/B12/4.00	Signature	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Page 1 of 1 AEG Contract No :- 4322A	

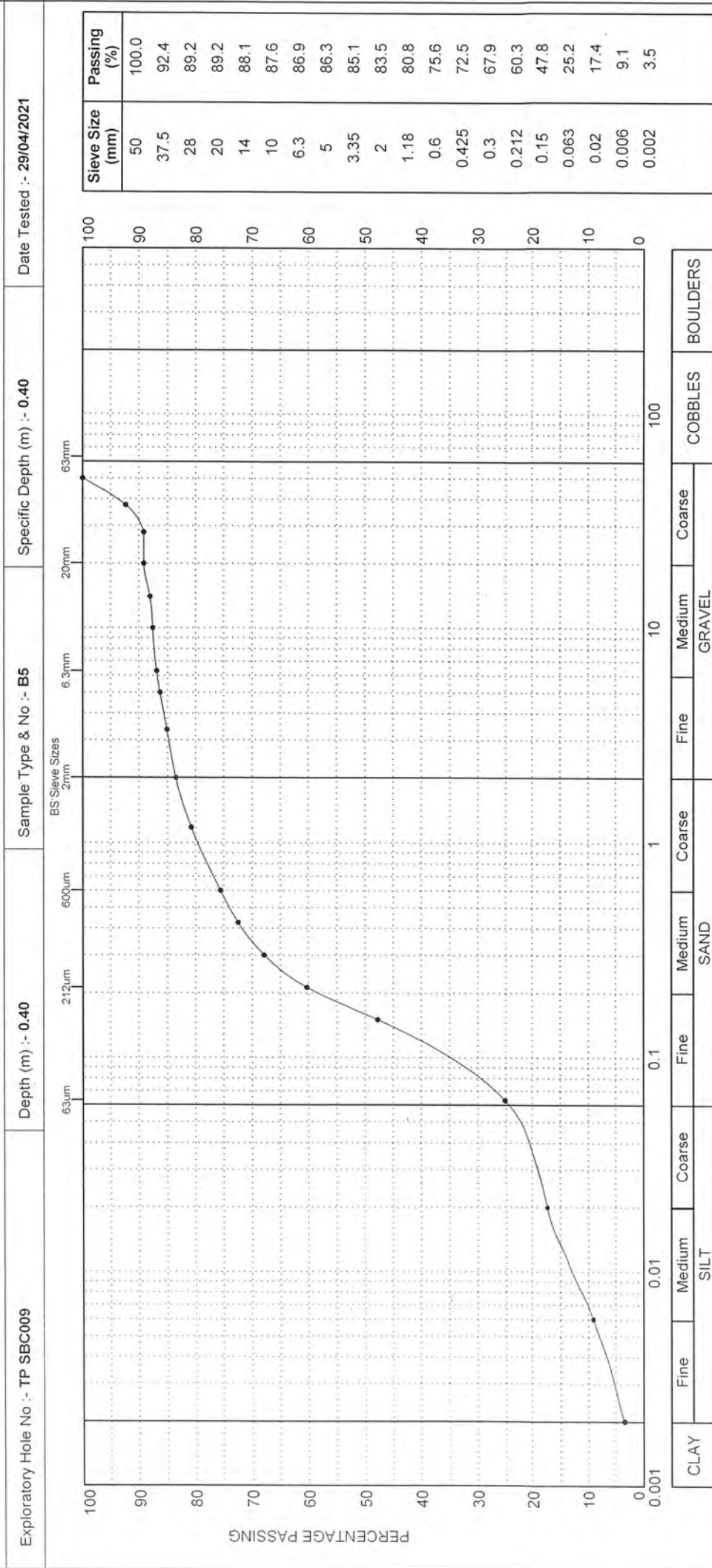


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :-	17/05/2021		Name :- [Redacted]	Page 1 of 1
	Certificate No :-	PSD/4322A/TP SBC009/B5/0.40			Signature
Client :-	AMEY OW Limited	Contract Title :-	A66 North Trans Pennine Scheme C Section 9		





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

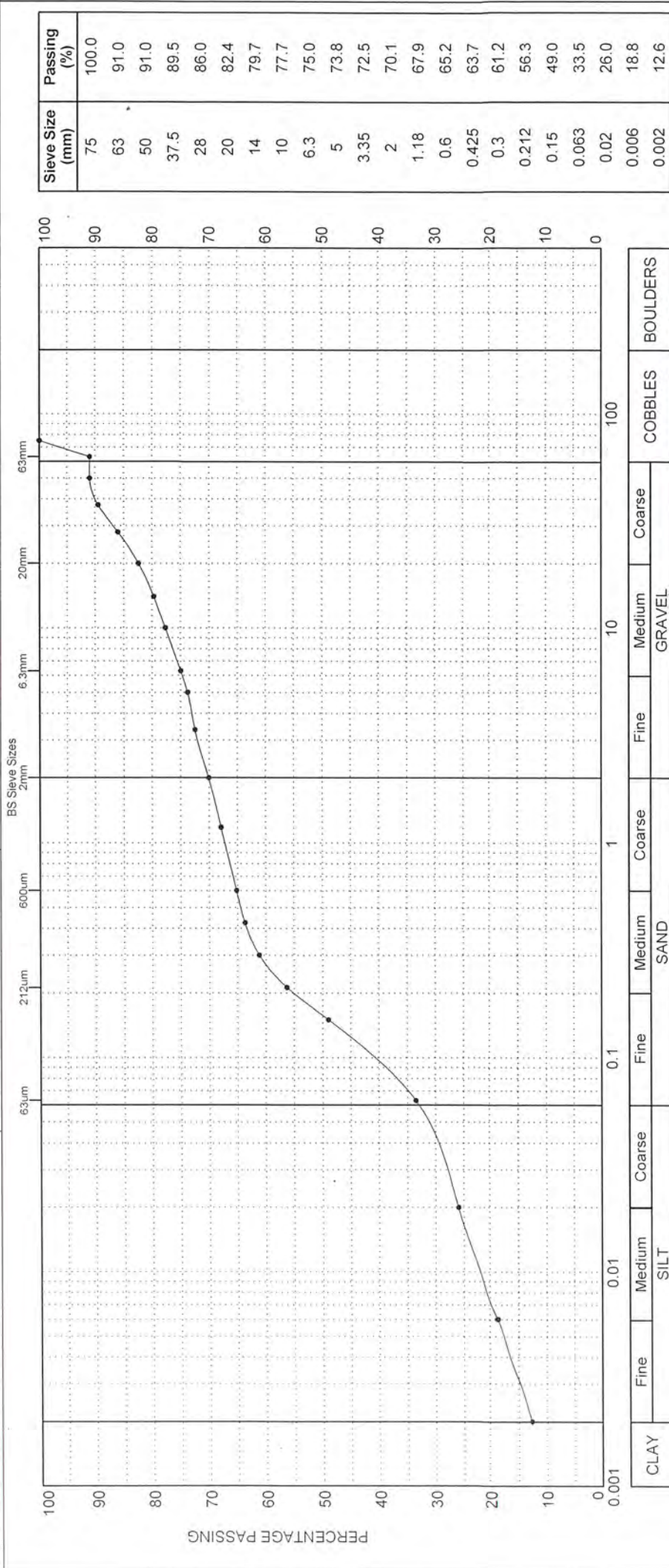
Head Office: Unit 25 Stella Cill Industrial Estate, Patton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Enniam Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- TP SBC010	Depth (m) :- 0.60	Sample Type & No :- B4	Specific Depth (m) :- 0.60	Date Tested :- 29/04/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC010/B4/0.60	Signature	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1

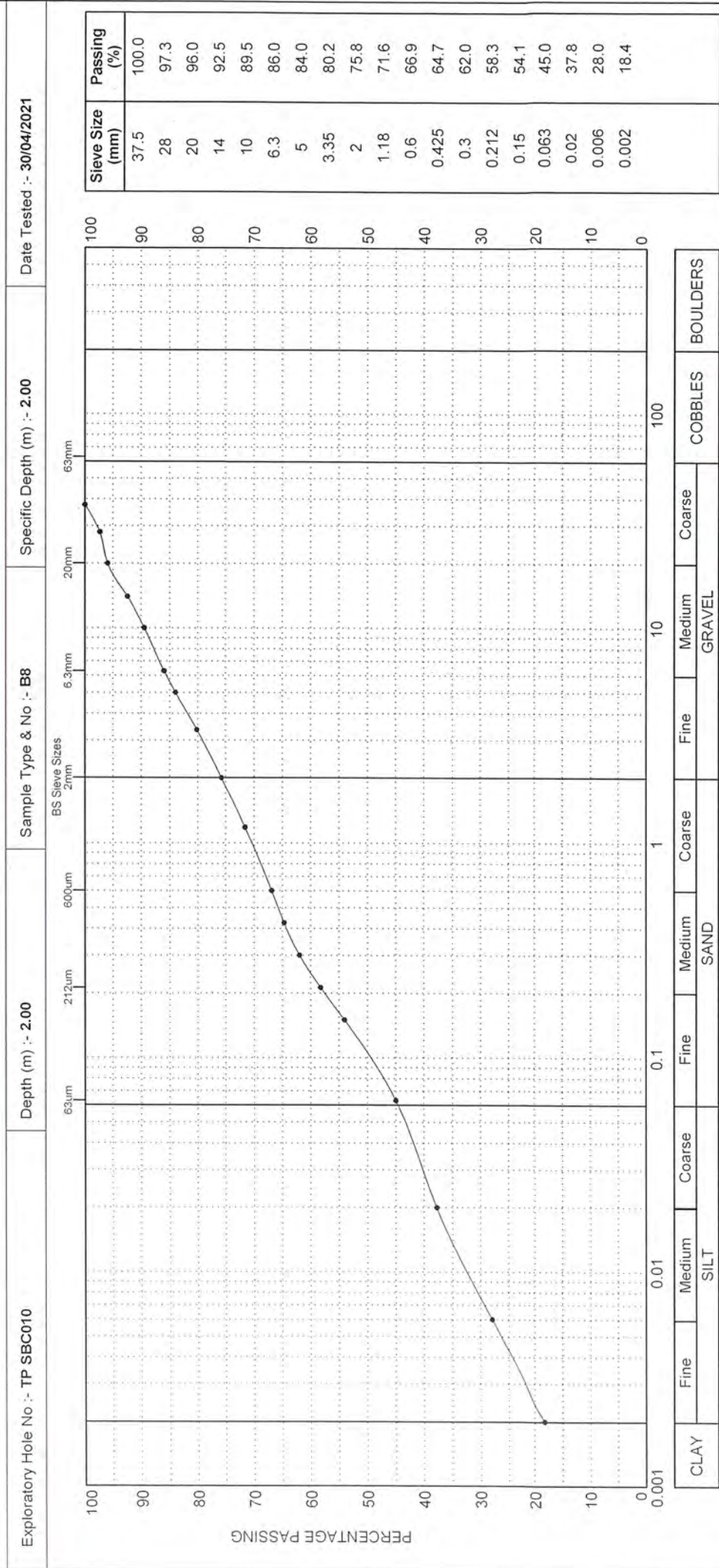
UKAS TESTING 1367

# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Skelton Cell Industrial Estate, Pelton Fell, Chesapeake Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



**AMEY**

Date of issue :- 17/05/2021

Certificate No :- PSD/4322A/TP SBC010/B8/2.00

Client :- AMEY OW Limited

Signature: [Redacted]

Name: **M. SELKIRK**

Contract Title :- A66 North Trans Pennine Scheme C Section 9

AEG Contract No :- 4322A

Page 1 of 1

For description of sample please refer to the Laboratory Sample Description Sheet

UKAS TESTING 1367

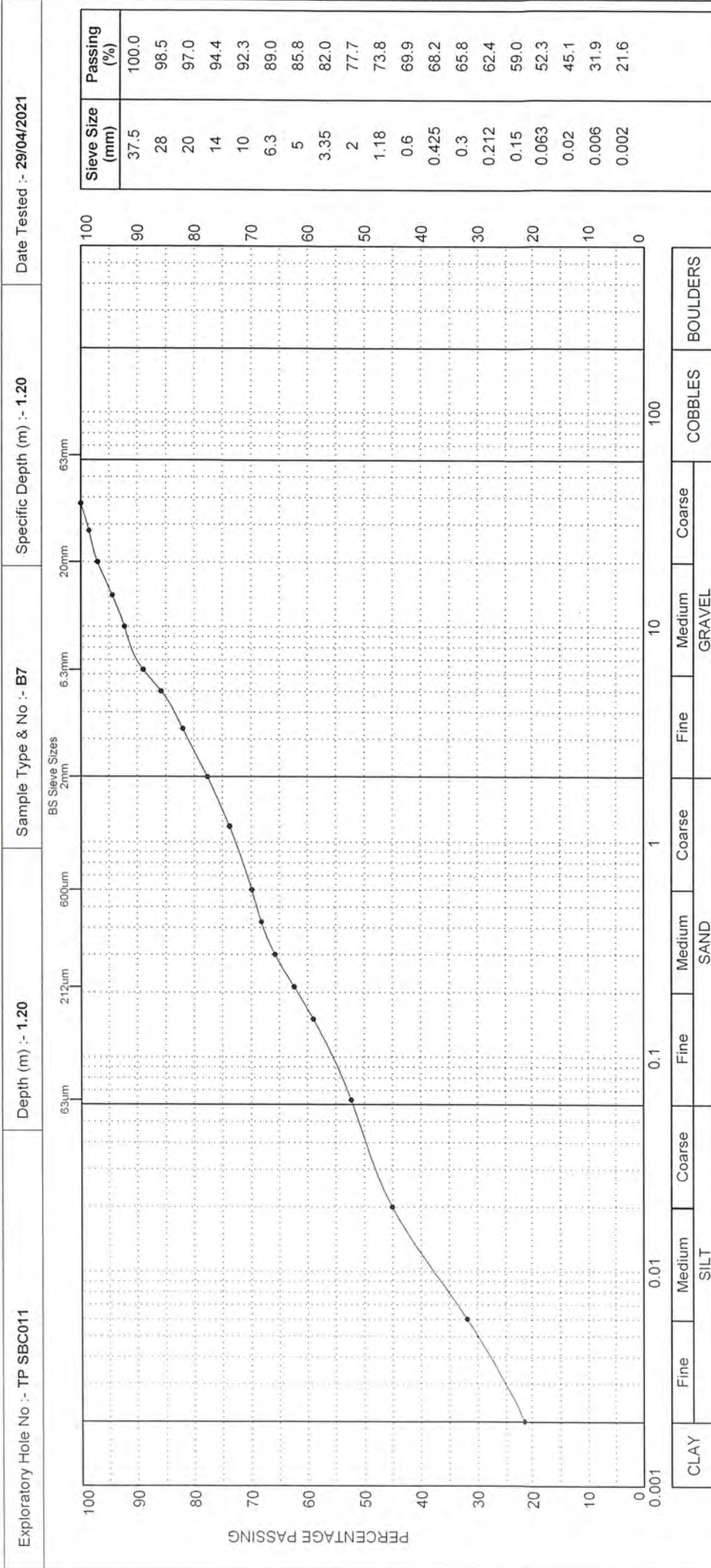


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Salford City Industrial Estate, Parkway, Farnley, Leeds LS28 7LQ  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC011/B7/1.20	Signature	Name
Client :- AMEY OW Limited		<b>M. SELKIRK</b>	
Contract Title :-		AEG Contract No :- 4322A	
AMEY OW Limited		A66 North Trans Pennine Scheme C Section 9	

Page 1 of 1

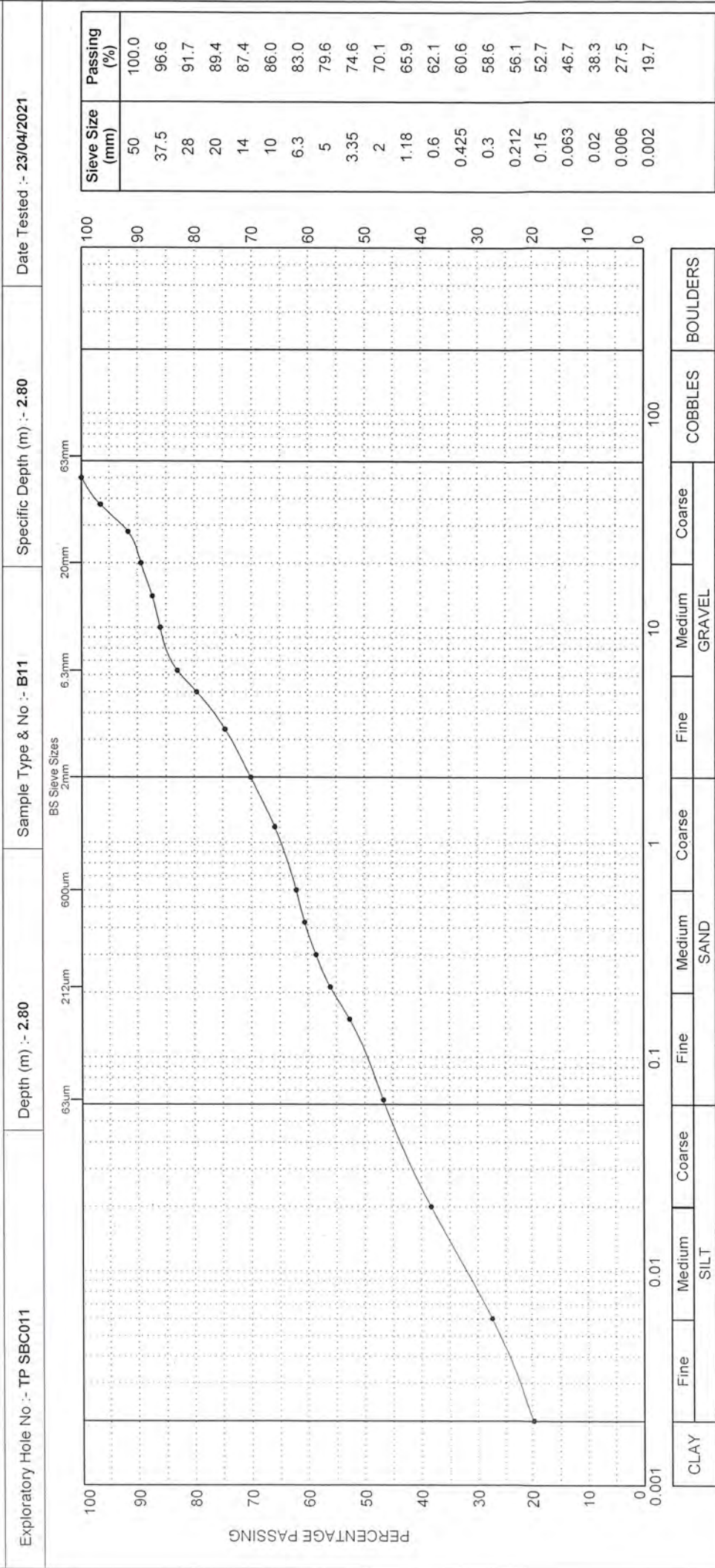


# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25, Stello Court Industrial Estate, Peilora Fell, Chester-le-Street, Co. Durham, DH2 1JL  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC011/B11/2.80	Signature	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		





# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Industrial Estate, Pelton, Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 25, Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP-SBC012A	Depth (m) :- 2.00	Sample Type & No :- B6	Specific Depth (m) :- 2.00	Date Tested :- 22/04/2021
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PERCENTAGE PASSING

Sieve Size (mm)	Passing (%)
14	100.0
10	99.4
6.3	98.0
5	97.6
3.35	96.7
2	95.0
1.18	92.8
0.6	90.4
0.425	89.5
0.3	88.3
0.212	86.8
0.15	85.1
0.063	81.5
0.02	70.2
0.006	53.1
0.002	34.9

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	BOULDERS
	SILT			SAND			GRAVEL			

For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021

Client :- AMEY OW Limited

Certificate No :- PSD/4322A/TP-SBC012A/B6/2.00

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Signature :- [Redacted]

Name :- M. SELVAK

Page 1 of 1

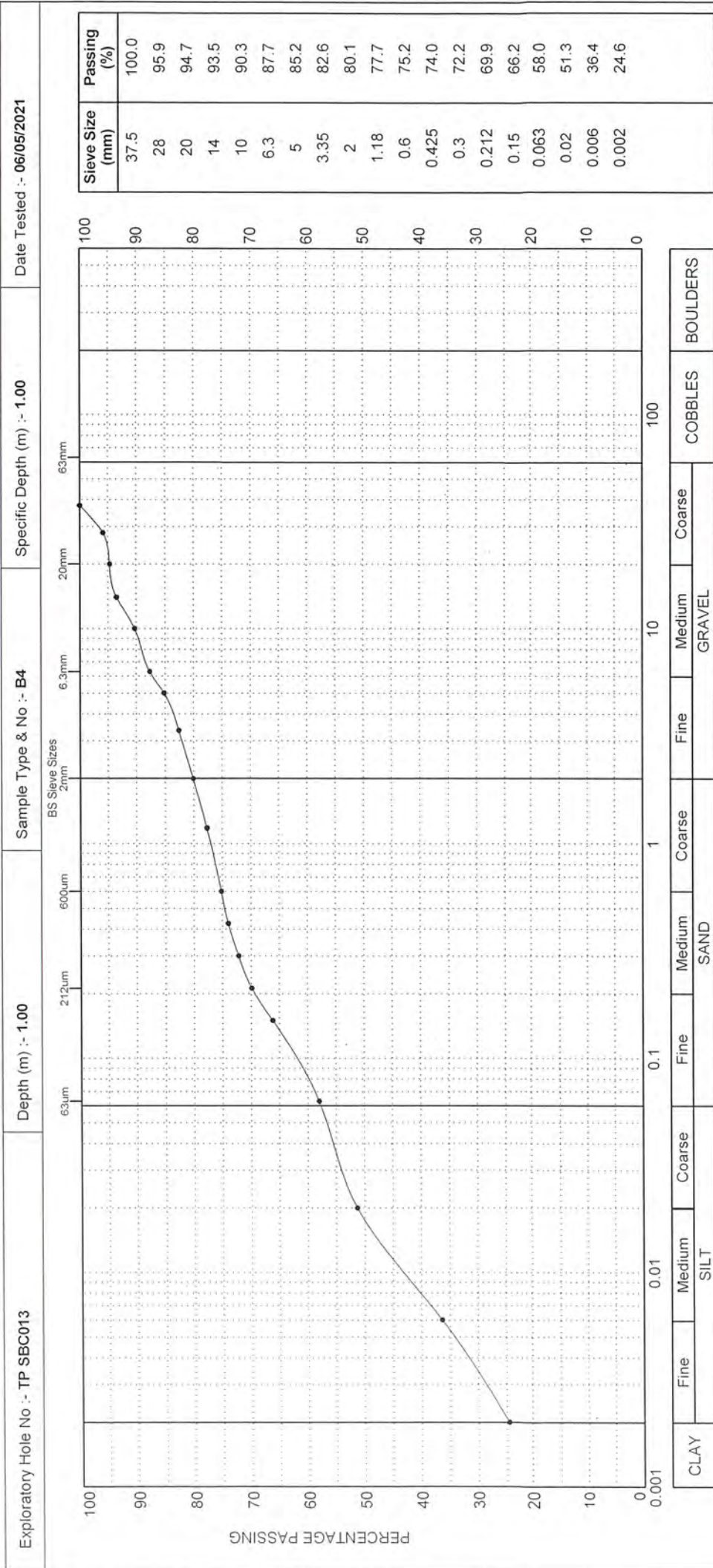
AEG Contract No :- 4322A

# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fall, Chester-le-Street, Co. Durham, DL3 7JF  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Bockburn, BB1 5BA

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



**AMEY**

Date of issue :- 27/05/2021

Client :- AMEY OW Limited

Certificate No :- PSDI/4322A/TP SBC013/B4/1.00

Contract Title :- A66 North Trans Pennine Scheme C Section 9

For description of sample please refer to the Laboratory Sample Description Sheet

Name :- **M. SELKIRK**

Signature

Page 1 of 1

AEG Contract No :- 4322A

UKAS TESTING 1367

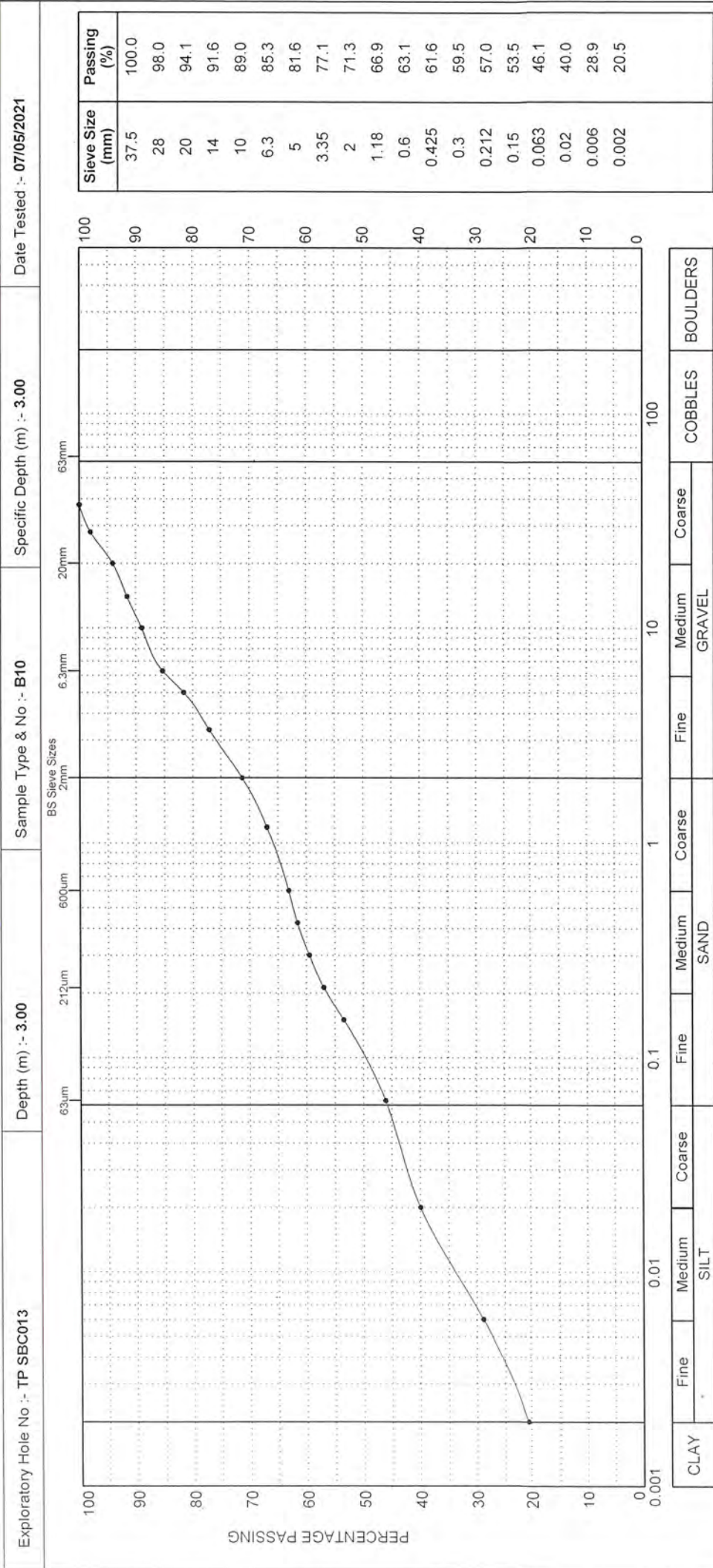


# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Court Industrial Estate, Peitroy Fell, Chester Street, Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Earnam Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

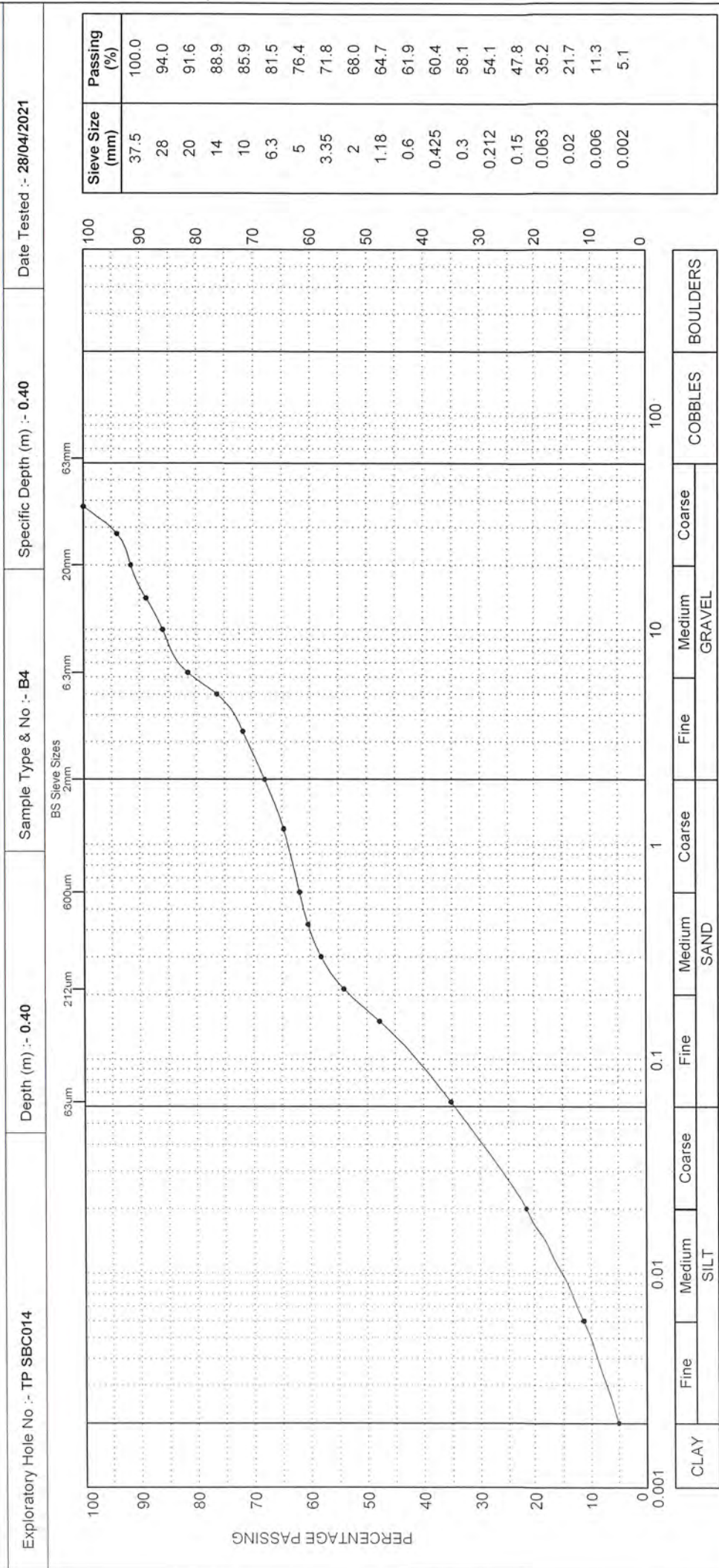
Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC013/B10/3.00	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fall, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 17/05/2021	Certificate No :- PSD/4322A/TP SBC014/B4/0.40	Signature	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1

UKAS TESTING 1367



# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

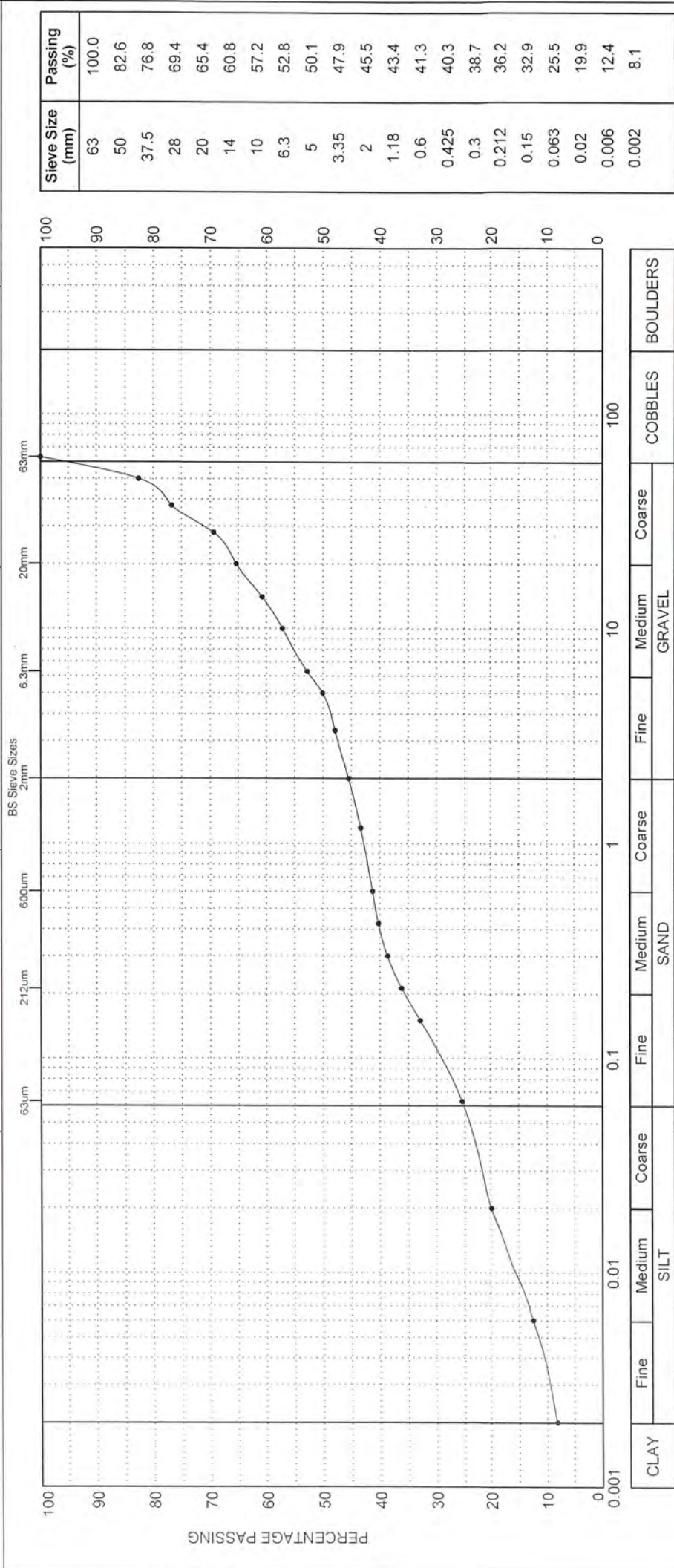
Head Office: Unit 25 Stella Cill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- TP SBC014	Depth (m) :- 1.60	Sample Type & No :- B9	Specific Depth (m) :- 1.60	Date Tested :- 27/04/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**  
Name :- [Redacted]

Date of issue :- 26/05/2021  
Certificate No :- PSD/4322A/TP SBC014/B9/1.60  
Signed :- [Redacted]

Client :- AMEY OW Limited  
Contract Title :- A66 North Trans Pennine Scheme C Section 9

Page 1 of 1  
AEG Contract No :- 4322A

**AEG** UKAS TESTING 1367

# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Salford City Industrial Estate, Redon Fell, Chester Street, Co. Durham, DH4  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

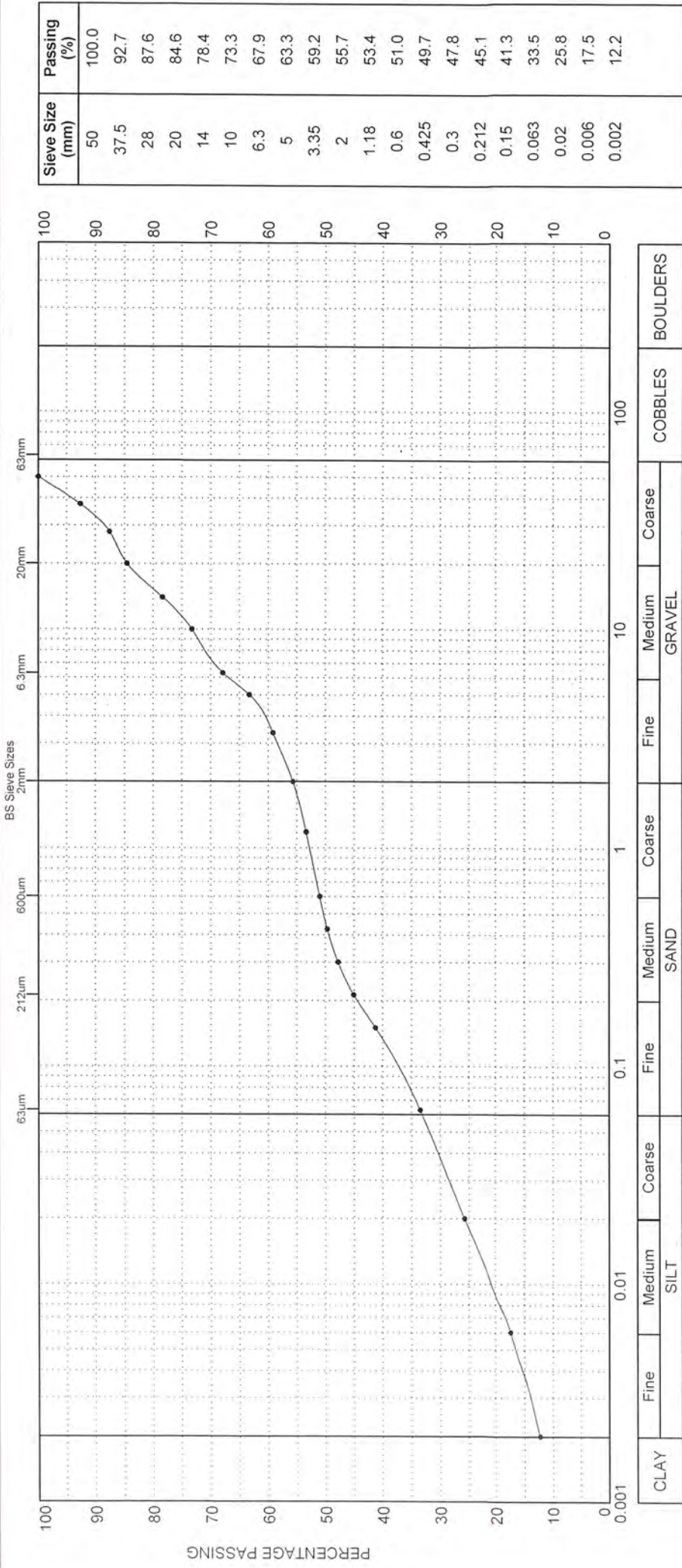
Exploratory Hole No :- TP SBC015

Depth (m) :- 1.00

Sample Type & No :- B4

Specific Depth (m) :- 1.00

Date Tested :- 05/05/2021



For description of sample please refer to the Laboratory Sample Description Sheet

<b>AMEY</b> Date of issue :- 27/05/2021 Client :- AMEY OW Limited	Certificate No :- PSD/4322A/TP SBC015/B4/1.00 Signed: [Redacted]	Name :- M. SELKIRK Page 1 of 1
	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A



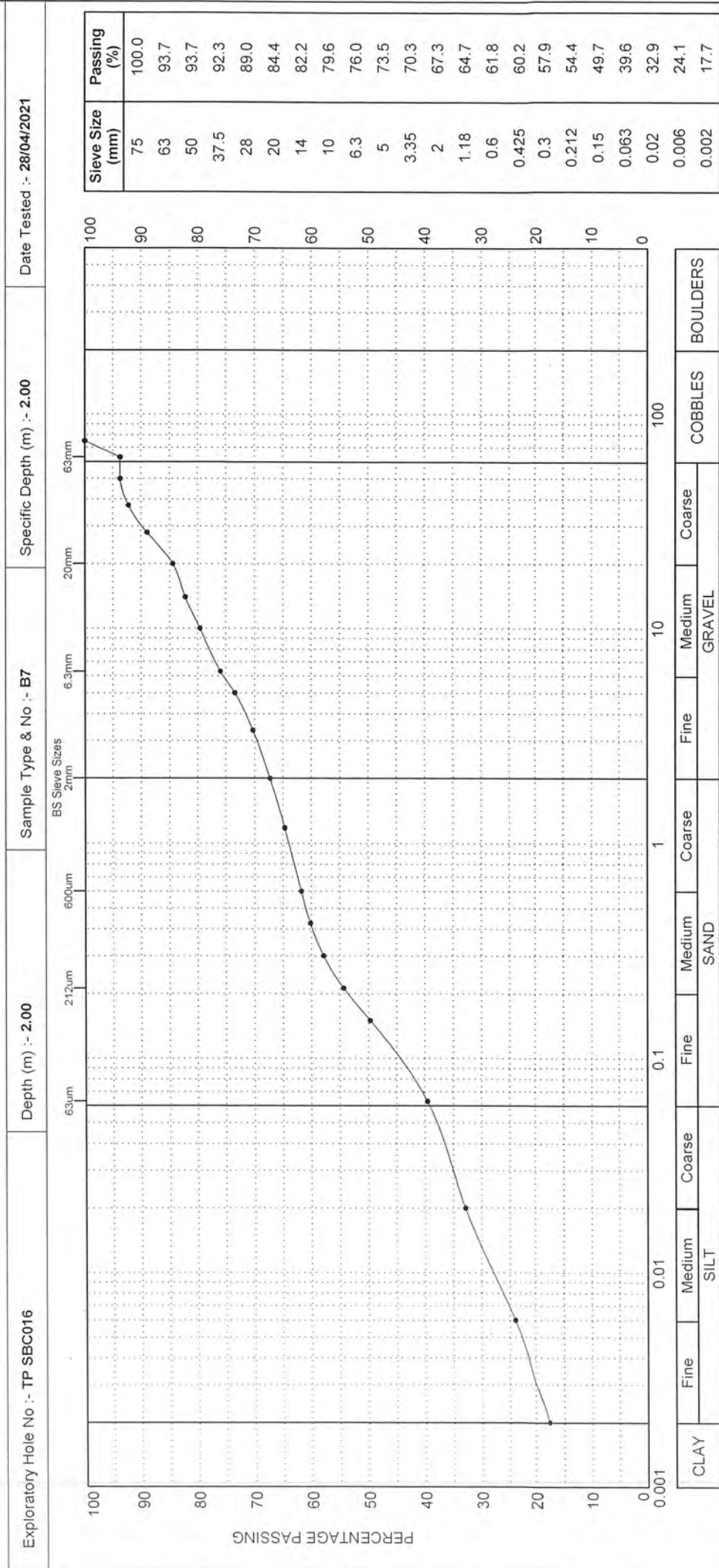


# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easingwold, East Yorkshire, YO21 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

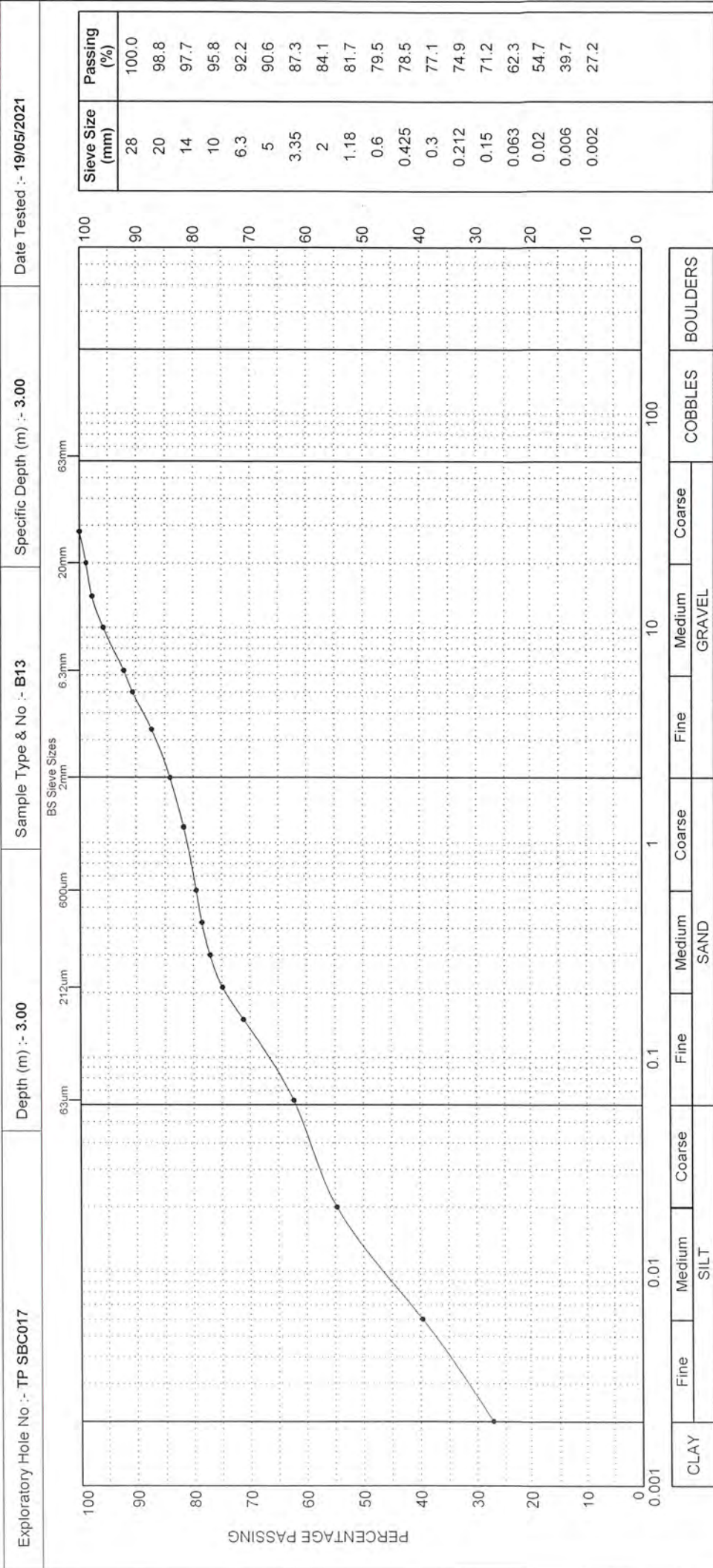
Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC016/B7/2.00	Signature	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		UKAS TESTING 1367

# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Oil Industrial Estate, Pelton Hill, Chester-le-Street, Co. Durham, DH4  
Regional Office: Unit 20 Business Development Centre, Earham Way, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC017/B13/3.00 Signed: [Redacted]	Name :- [Redacted]	Page 1 of 1
	Client :- AMEY OW Limited			Contract Title :- A66 North Trans Pennine Scheme C Section 9



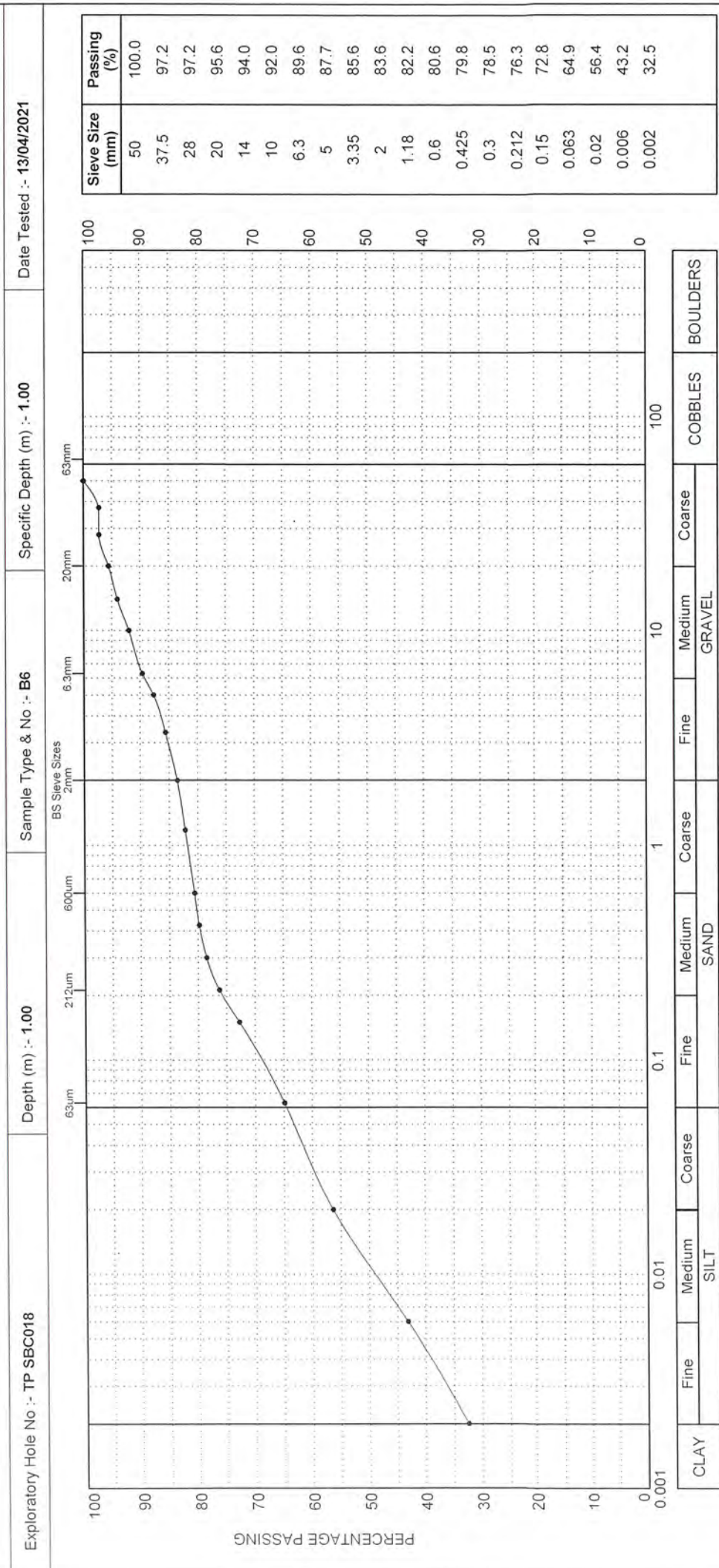


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Stella Hill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No. :- PSD/4322A/TP SBC018/B6/1.00	Signature	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A	

Page 1 of 1

UKAS TESTING 1367

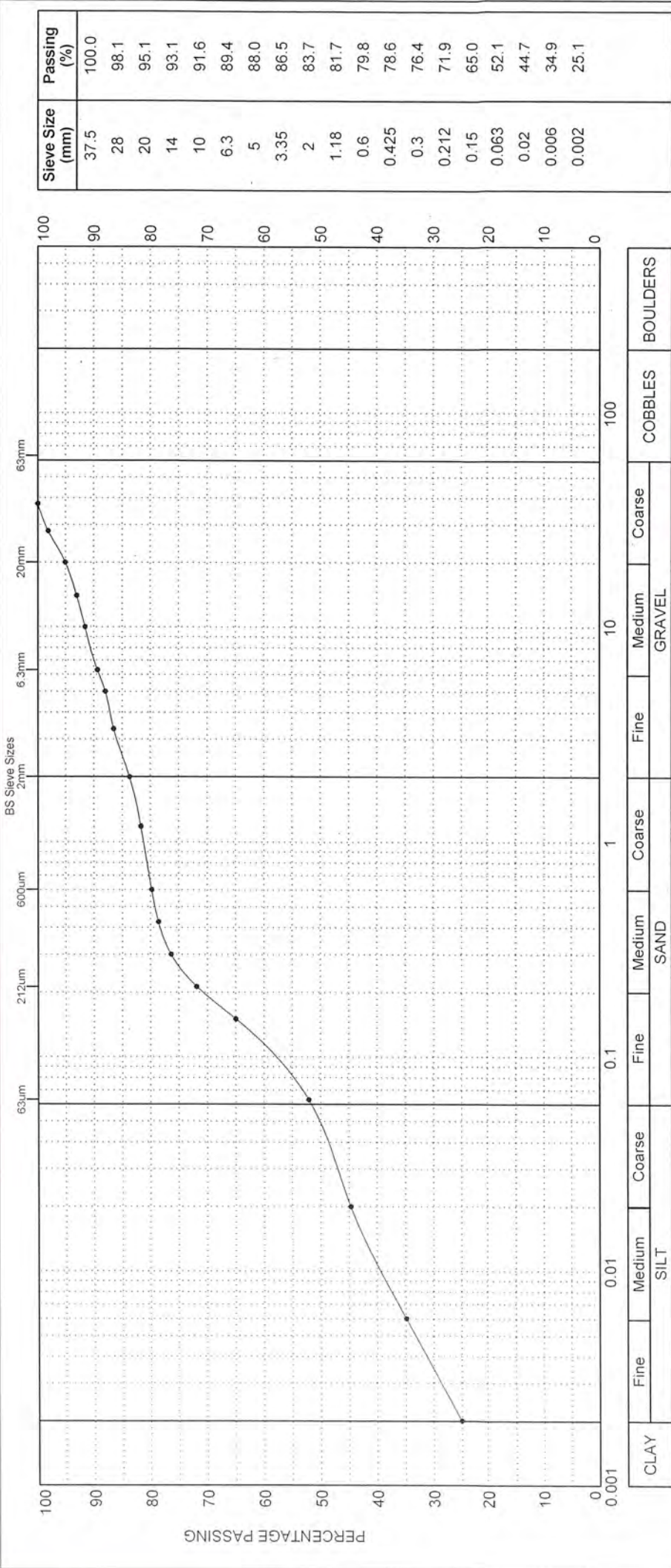
# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Skella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BL

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC019	Depth (m) :- 0.40	Sample Type & No :- B4	Specific Depth (m) :- 0.40
			Date Tested :- 05/05/2021



Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC019/B4/0.40	Signature [Redacted]	Name M. SELVARAJU
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	Page 1 of 1





# ALLIED EXPLORATION & GEOTECHNICAL LIMITED

Head Office: Unit 25 Stella Cell Industrial Estate, Pease Fold, Chesham Street, Co. Dunham, DK2  
Regional Office: Unit 20, Business Development Centre, Epsom Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

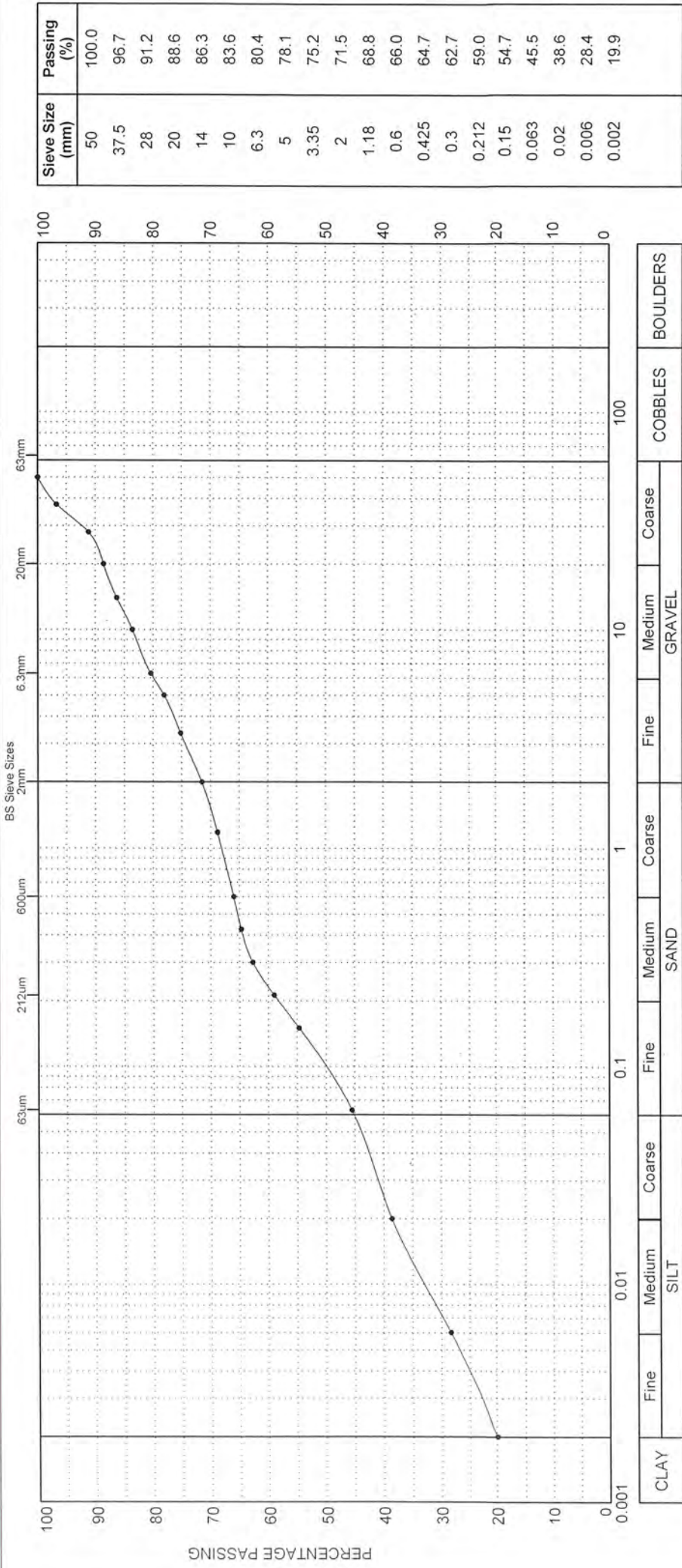
Exploratory Hole No :- TP SBC020

Depth (m) :- 2.00

Sample Type & No :- B10

Specific Depth (m) :- 2.00

Date Tested :- 04/05/2021



Date of issue :- 26/05/2021		Certificate No :- PSD/4322A/TP SBC020/B10/2.00		Signature		Name :- <b>M. SELKIRK</b>		Page 1 of 1	
Client :- AMEY OW Limited		Contract Title :-		Contract No :-		AEG Contract No :-		4322A	
A66 North Trans Pennine Scheme C Section 9									

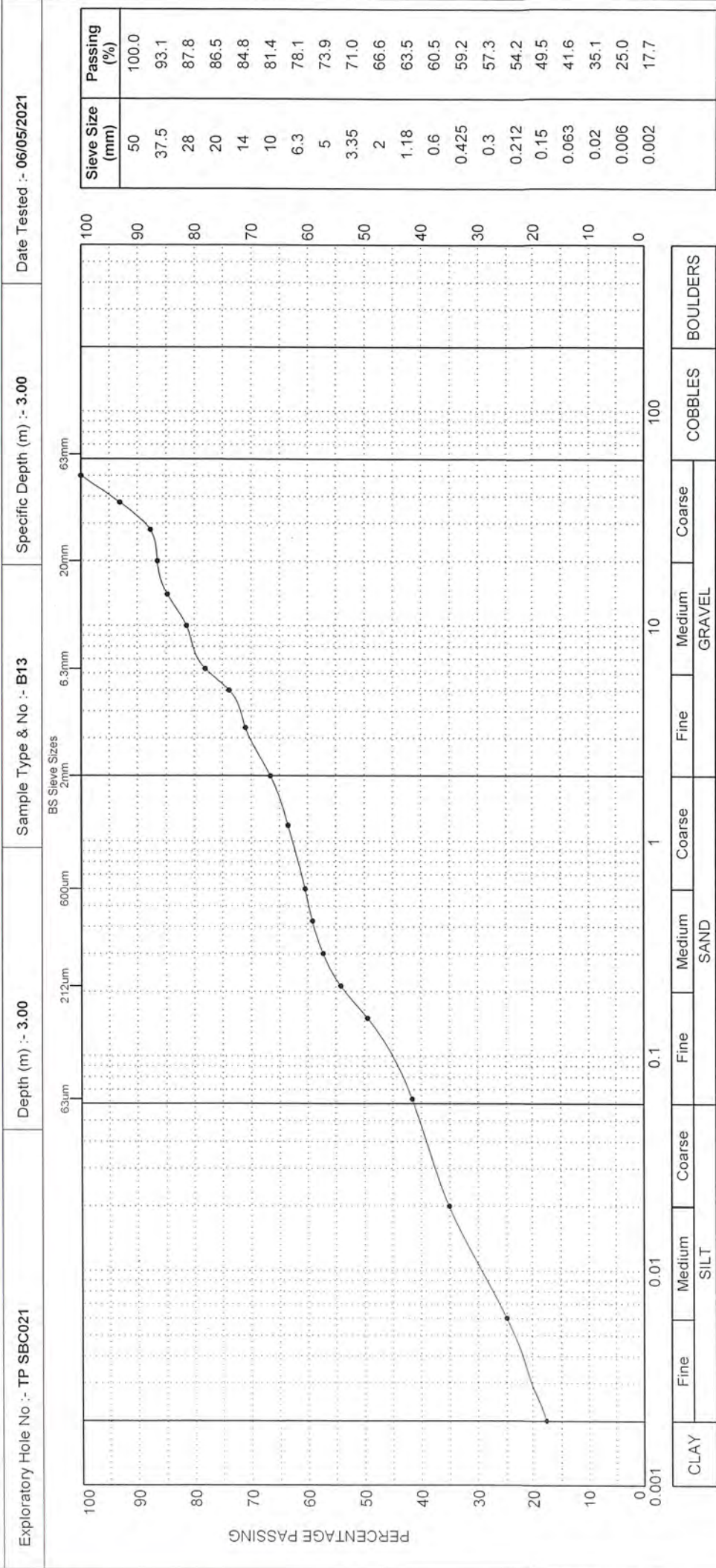


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Seabra Cliff Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Earsom Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC021/B13/3.00	Signature :-	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1



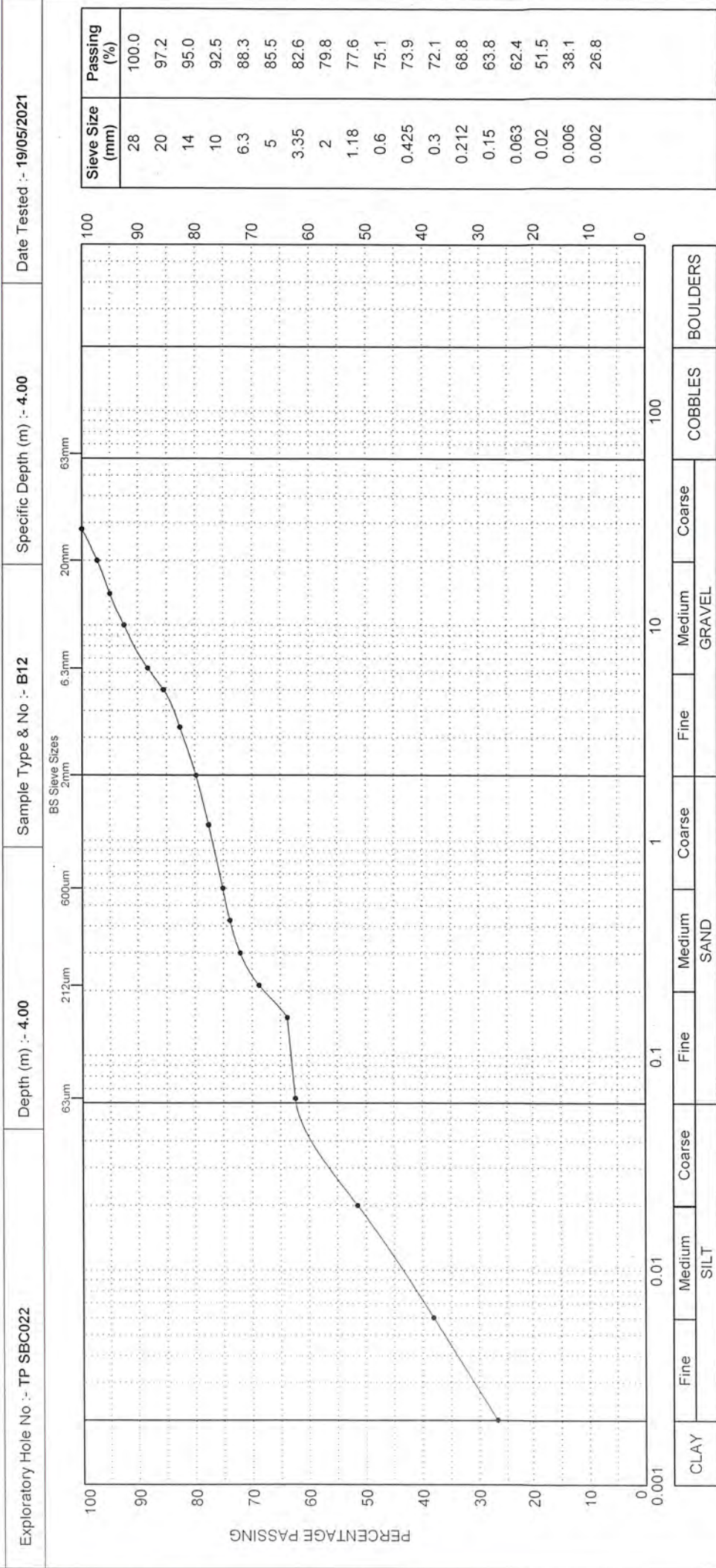


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 26 Skilla Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 28/05/2021	Certificate No :- PSD/4322A/TP SBC022/B12/4.00	Sign	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	Contract No :- 4322A	AEG Contract No :- 4322A	





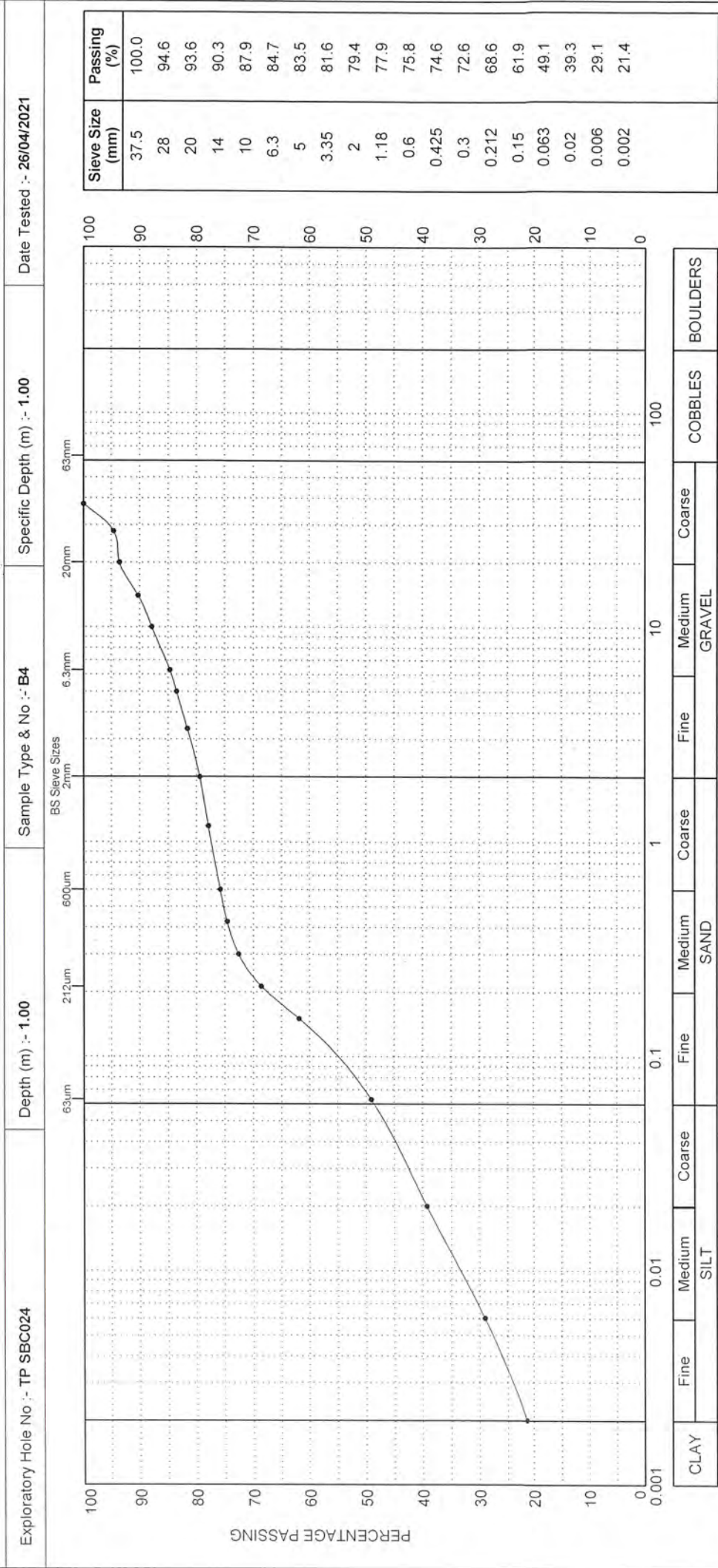


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH  
Regional Office: Unit 20, Business Development Centre, Earsom Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	BOULDERS
	SILT			SAND			GRAVEL			

	Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC024/B4/1.00	Sign
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		
Name :- <b>M. SELKIRK</b>		AEG Contract No :- 4322A	
Page 1 of 1			

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skala Gill Industrial Estate, Pelton Fell, Chesketon Street, Co. Durham, DH7  
Regional Office: Unit 20, Business Development Centre, Earsom Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

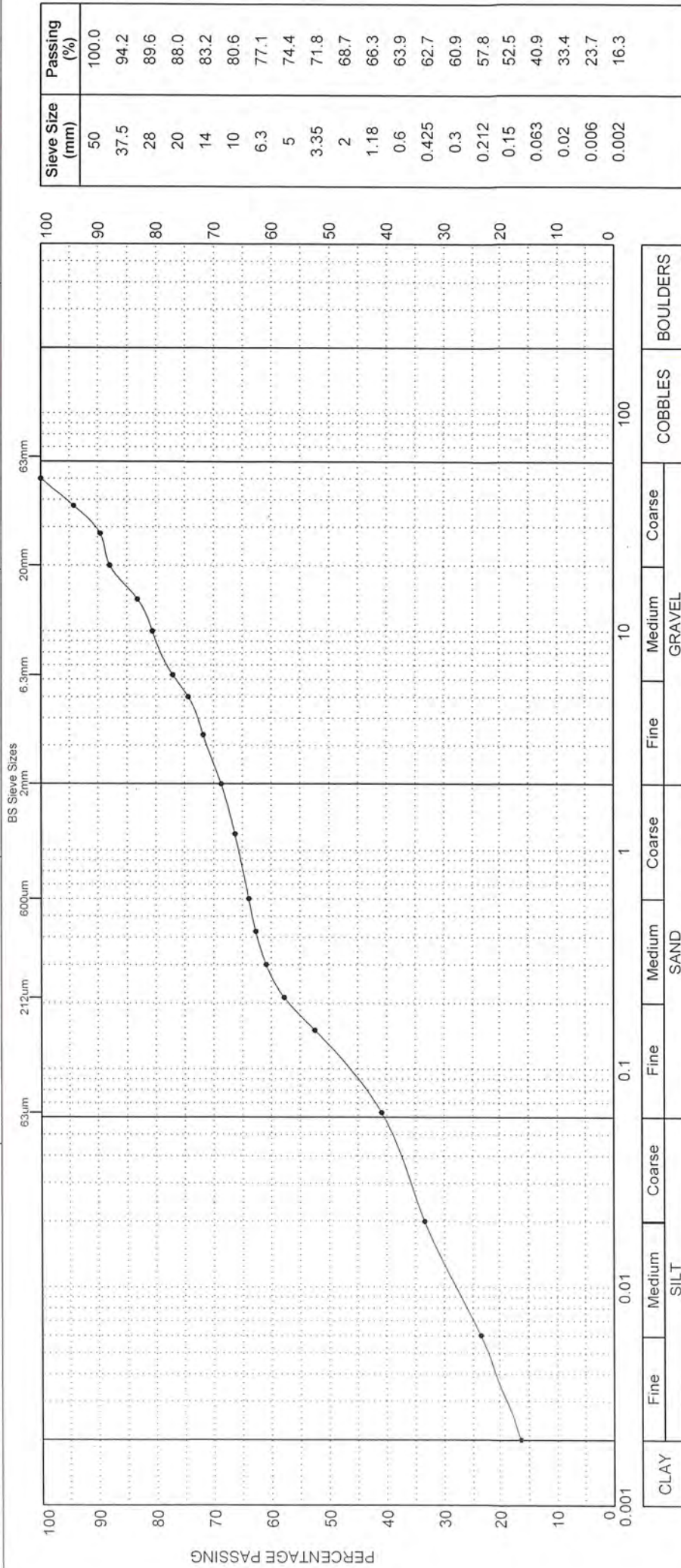
Exploratory Hole No :- TP SBC024

Depth (m) :- 2.00

Sample Type & No :- B7

Specific Depth (m) :- 2.00

Date Tested :- 26/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

**M. SELKIRK**

Name: [Redacted]

Sign: [Redacted]

Date of issue :- 26/05/2021

Client :- AMEY OW Limited

Page 1 of 1

AEG Contract No :- 4322A

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Certificate No :- PSD/4322A/TP SBC024/B7/2.00

AMEY OW Limited



1367



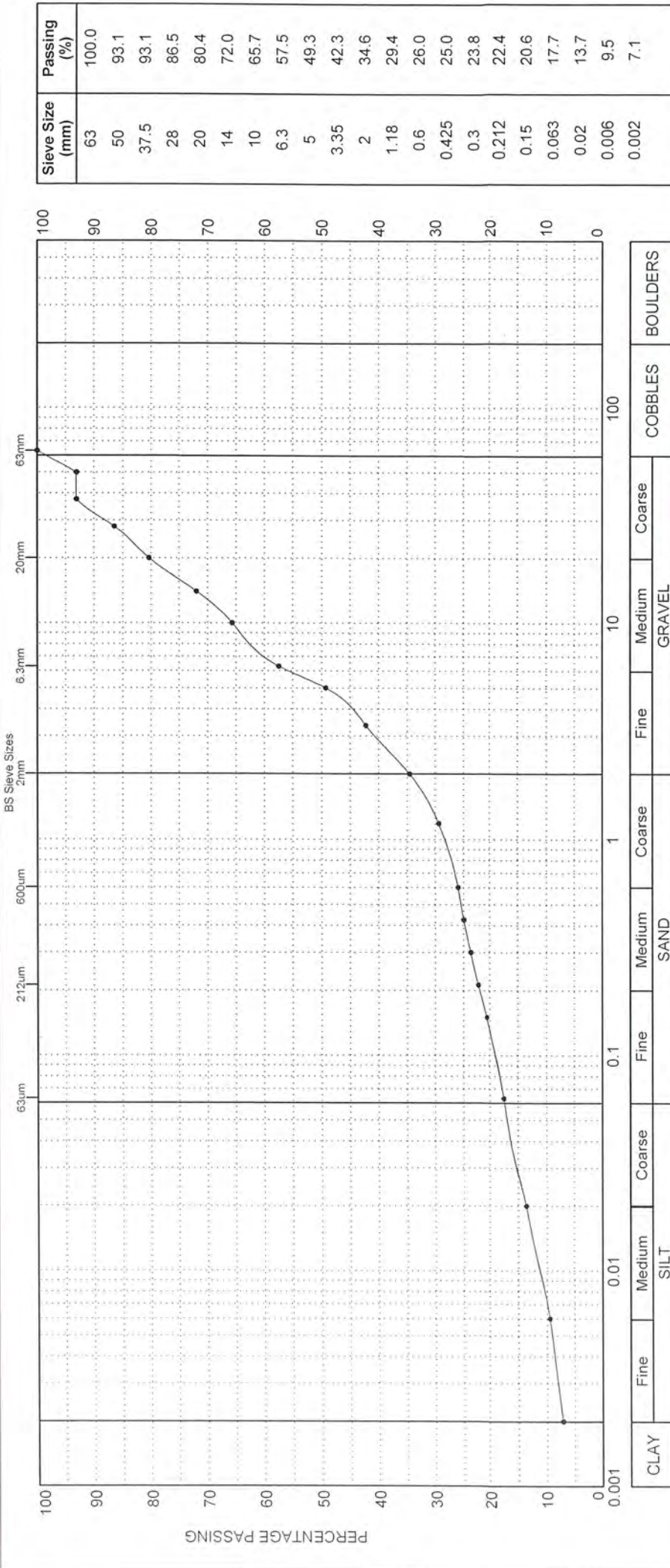
# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Stella Hill Industrial Estate, Pelton Hill, Chester-le-Street, Co. Durham, DH1  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990  
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- TP SBC024      Depth (m) :- 3.00      Sample Type & No :- B11      Specific Depth (m) :- 3.00      Date Tested :- 15/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

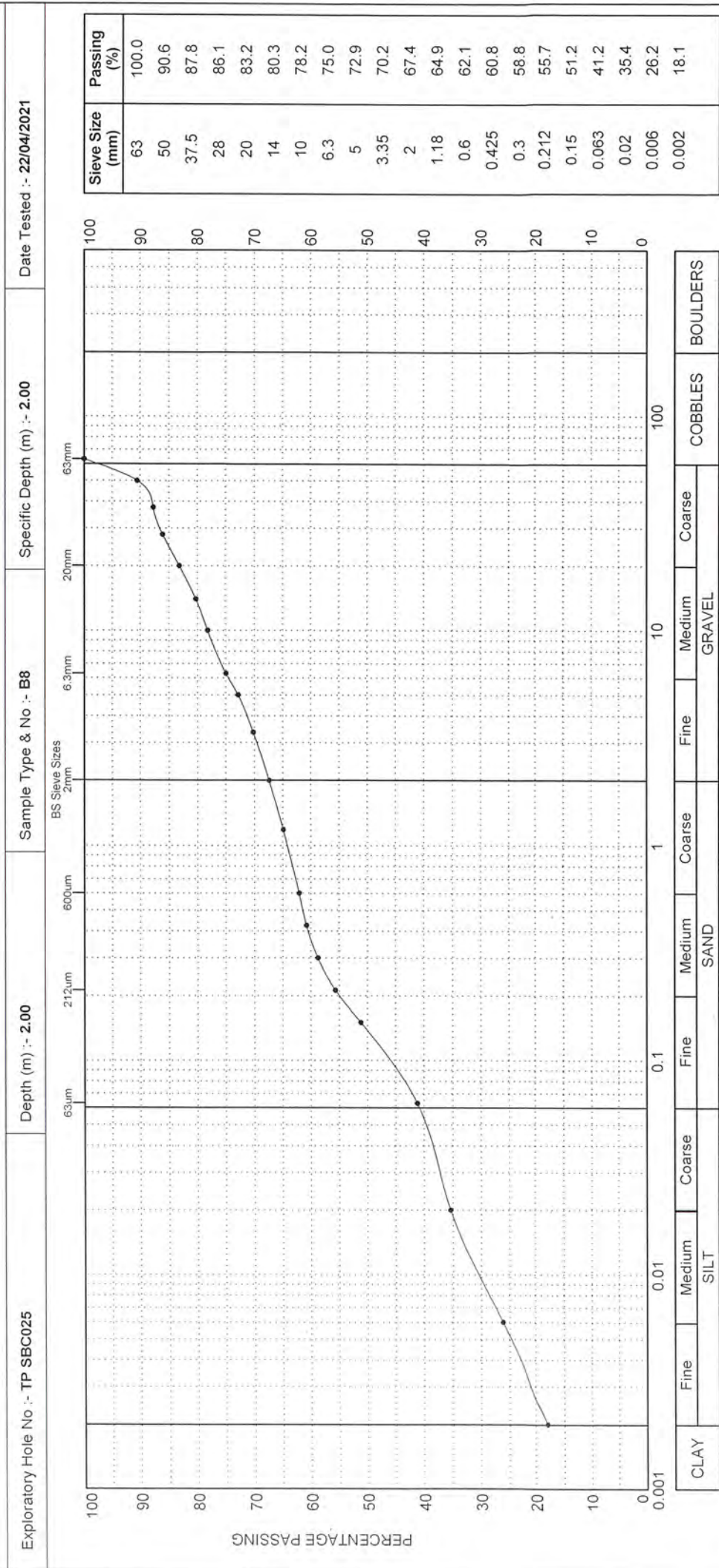
<b>AMEY</b>	Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC024/B11/3.00	Sign
Client :- AMEY OW Limited	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	
Name :- <b>M. SELKIRK</b>		AEG Contract No :- 4322A	
Page 1 of 1			

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fall, Chester-le-Street, Co. Durham, DH8 7JG  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5EJ

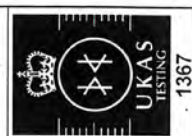
## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 26/05/2021	Certificate No. :- PSD/4322A/TP SBC025/B8/2.00	Signature	Name :- [Redacted]	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A		



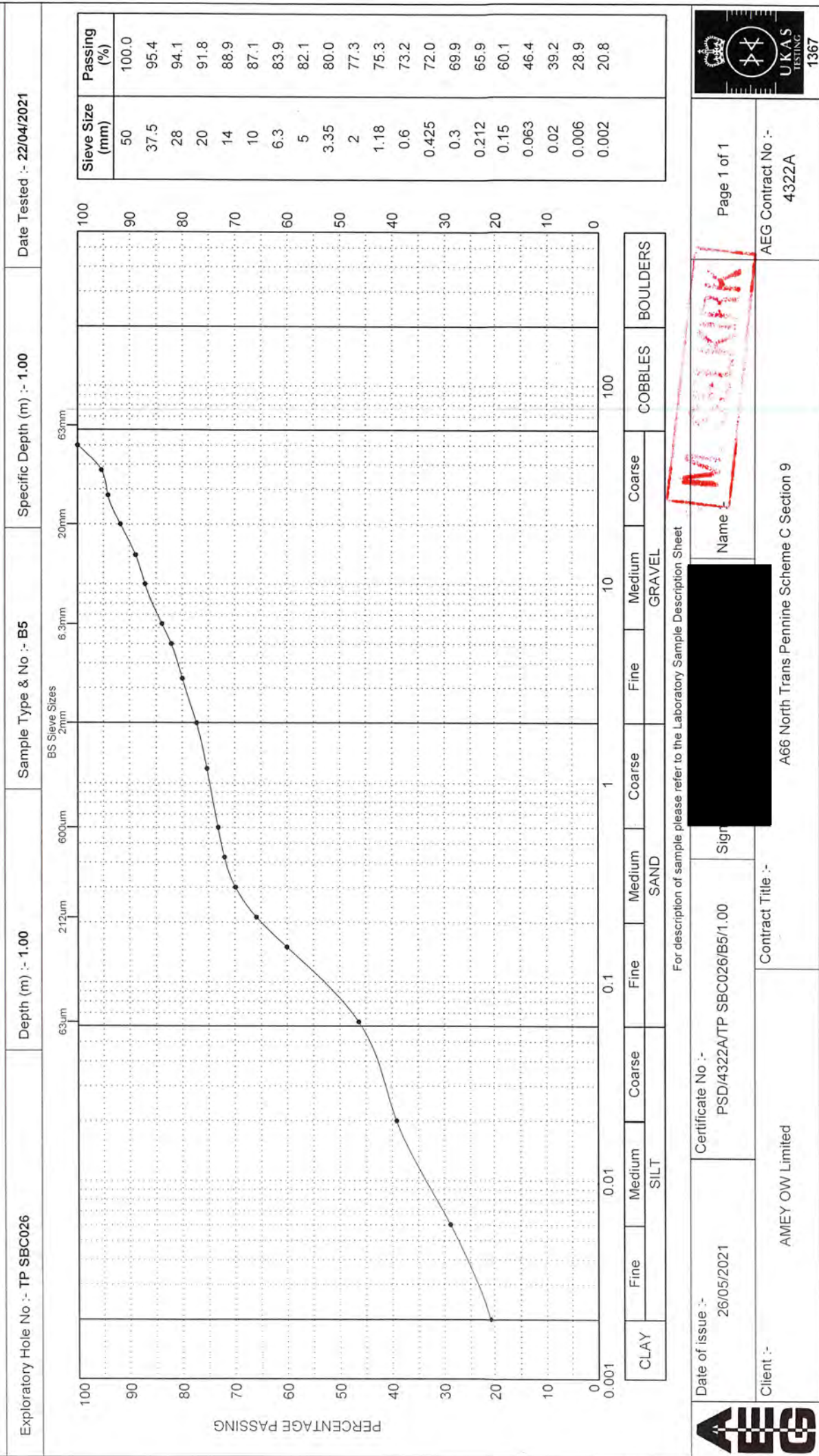


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co Durham, DH  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5E

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



Page 1 of 1  
AEG Contract No :- 4322A

**WORK**

Name: [Redacted]  
A66 North Trans Pennine Scheme C Section 9

Certificate No :- PSD/4322A/TP SBC026/B5/1.00  
Sign: [Redacted]

Date of issue :- 26/05/2021  
Client :- AMEY OW Limited  
Contract Title :-

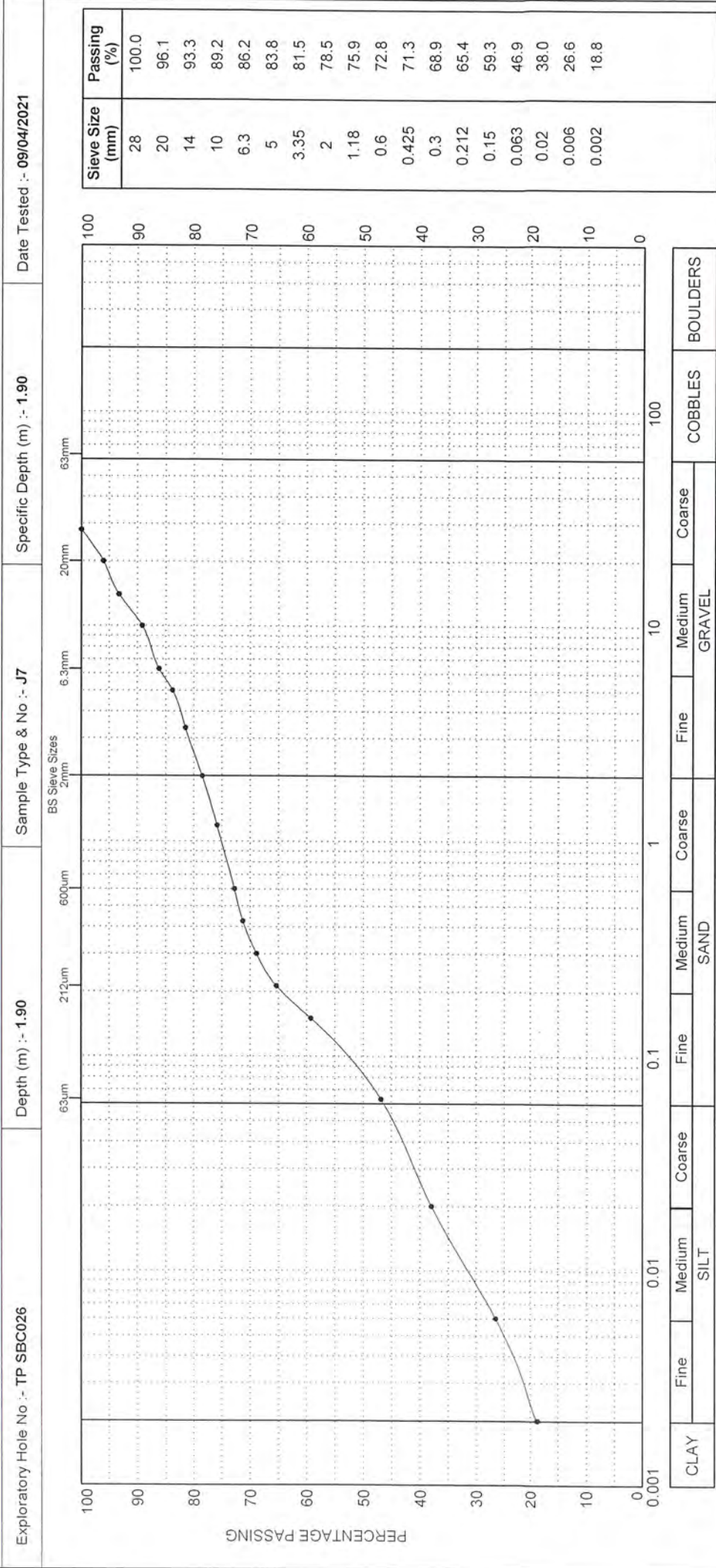


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Palkon Fell, Chester-le-Street, Co. Durham, DH1 1SE  
Regional Office: Unit 20, Business Development Centre, Epsom Wharf, Blackburn, BB1 5EJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL							

 Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC026/J7/1.90 Sign: <span style="background-color: black; color: black;">[Redacted]</span>	Name: <span style="background-color: black; color: black;">[Redacted]</span> M. SELKIRK	Page 1 of 1 AEG Contract No :- 4322A
Client :- AMEY OW Limited	A66 North Trans Pennine Scheme C Section 9		



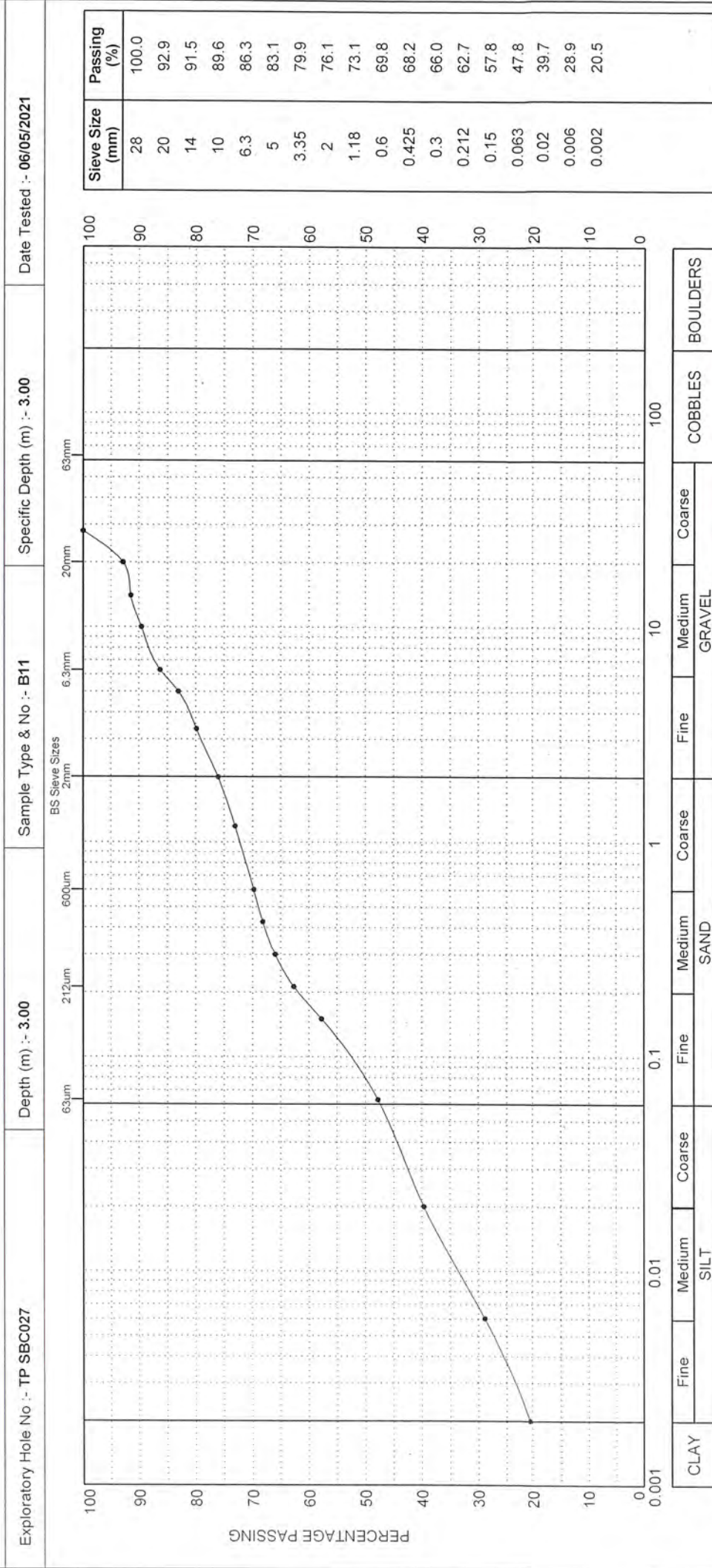


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5E

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

<b>AMEG</b>	Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC027/B11/3.00	Sign
Client :- AMEY OW Limited	Contract Title :-		
A66 North Trans Pennine Scheme C Section 9		AEG Contract No :- 4322A	
Name :- M SELKIRK		Page 1 of 1	

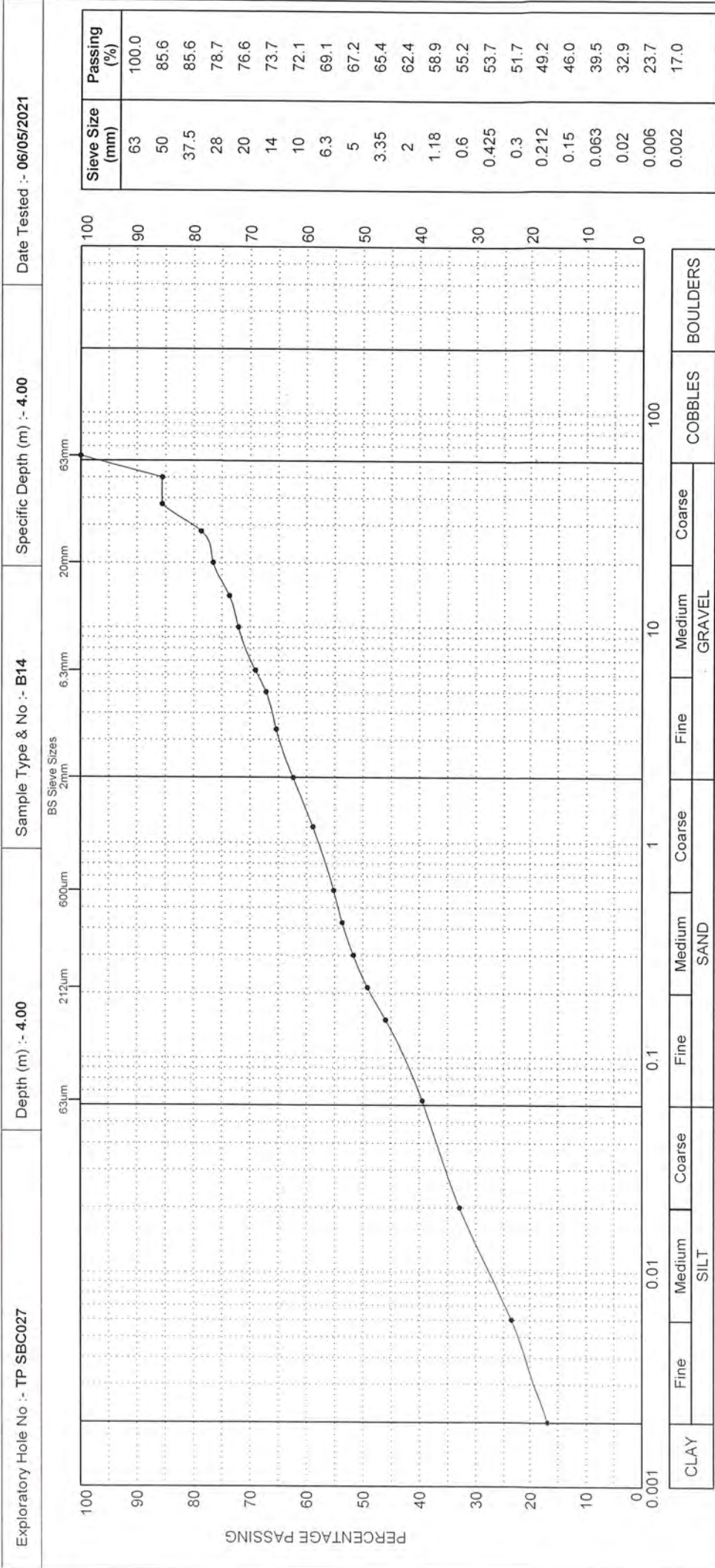


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5F

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

<b>AMEY</b>	Date of issue :- 26/05/2021	Certificate No :- PSDI/4322A/TP SBC027/B14/4.00	Sign
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		
Name :- M. SELKIRK		AEG Contract No :- 4322A	
Page 1 of 1		UKAS TESTING 1367	

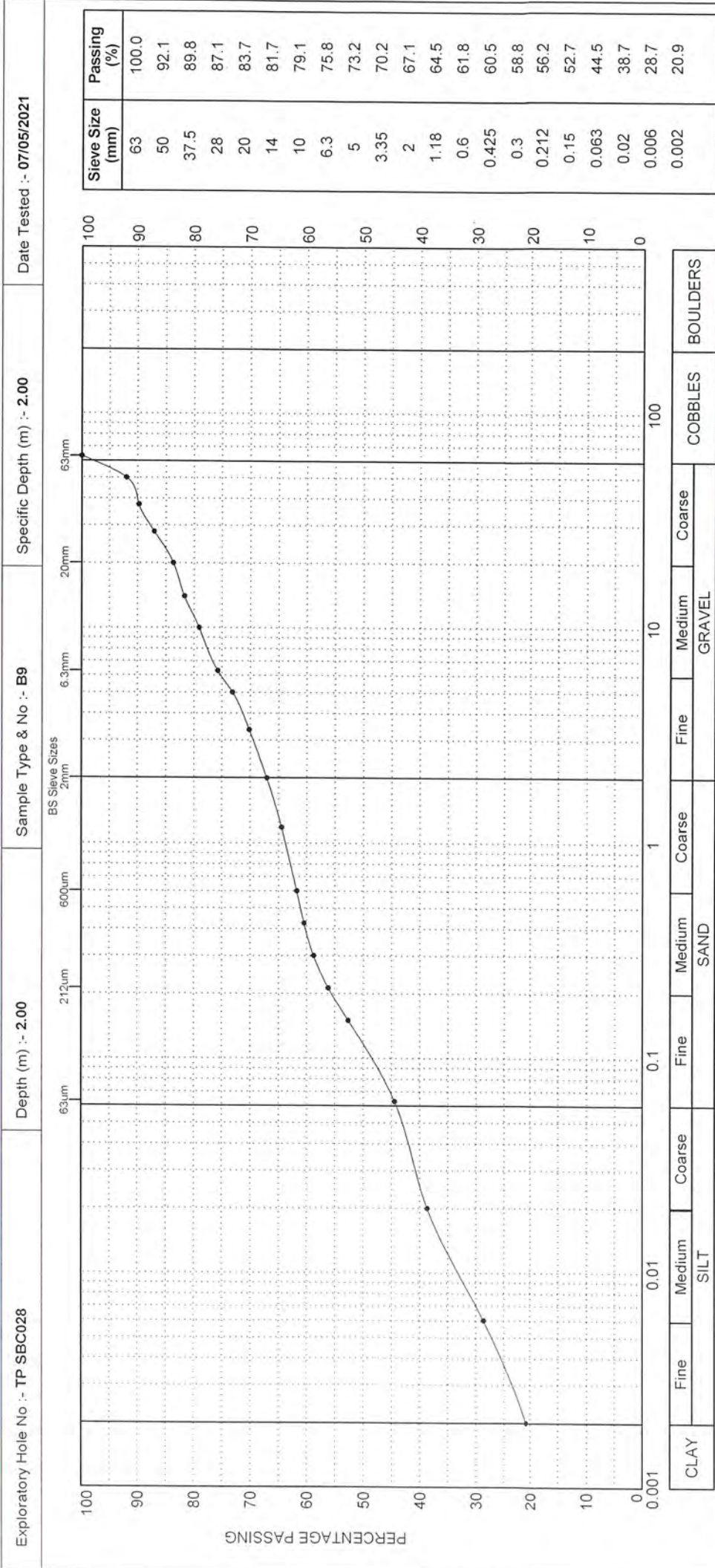


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH8 7JH  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5EP

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 26/05/2021	Certificate No. :- PSD/4322A/TP SBC028/B9/2.00	Sign	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No. :- 4322A	

Page 1 of 1

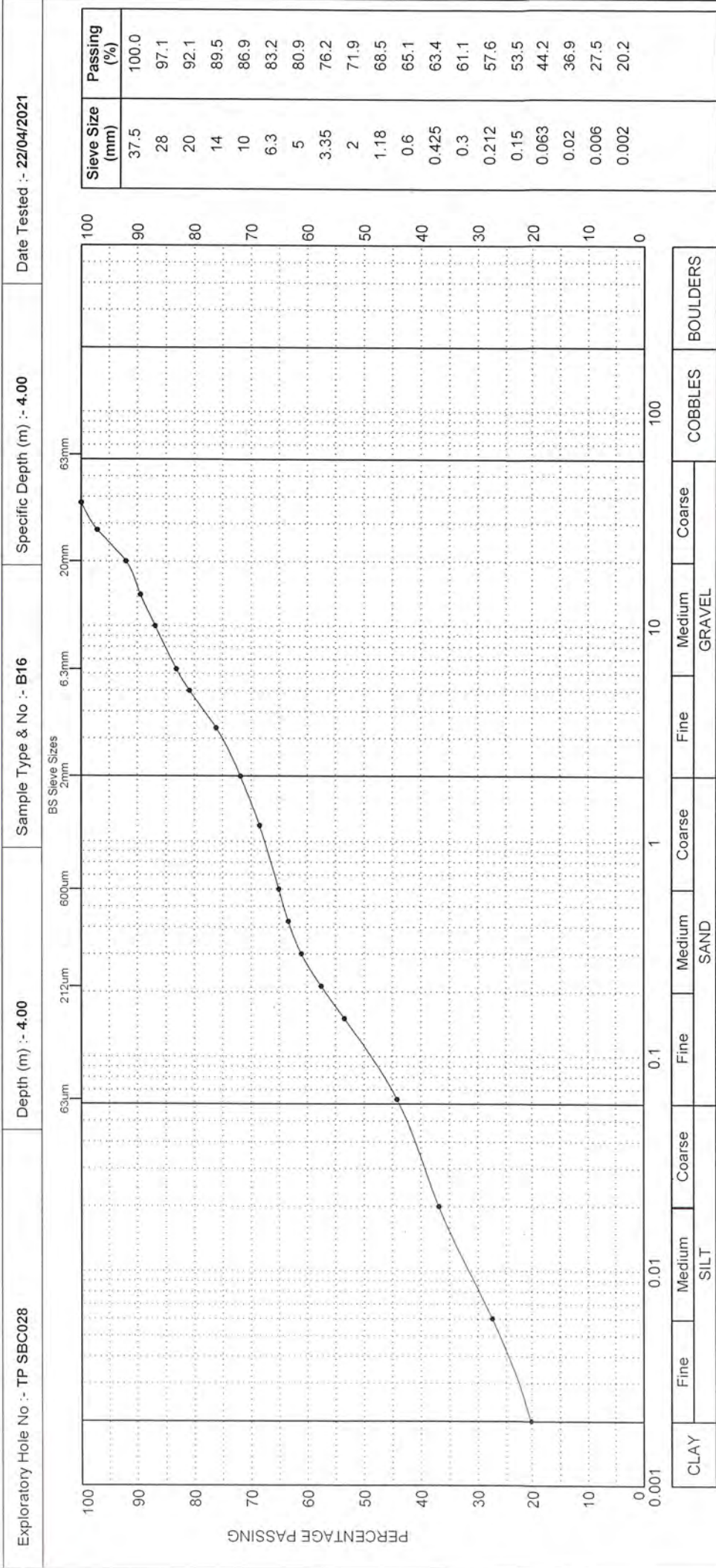


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Skala Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1 1JH  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
			SAND			GRAVEL					

	Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC028/B16/4.00	Signature :- <div style="background-color: black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		AEG Contract No :- 4322A
			Page 1 of 1



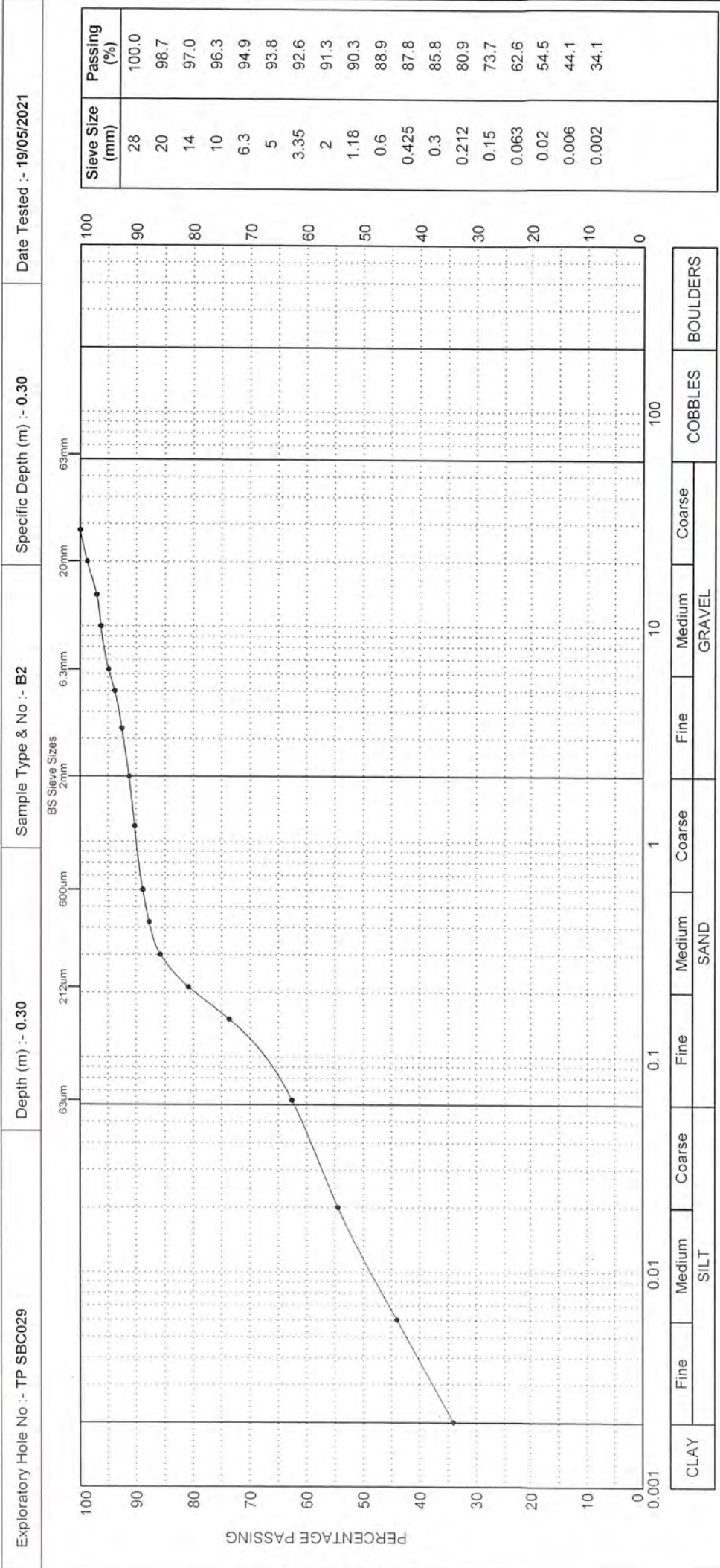


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Court Industrial Estate, Peltor Fell, Chester-le-Street, Co. Durham, DL10 1JH  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Bascoburn, BB1 5EJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

<b>AMEY</b>	Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC029/B2/0.30	Signature :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Page 1 of 1
Contract No :- 4322A		AEG Contract No :- 4322A	

**M. SELKIRK**

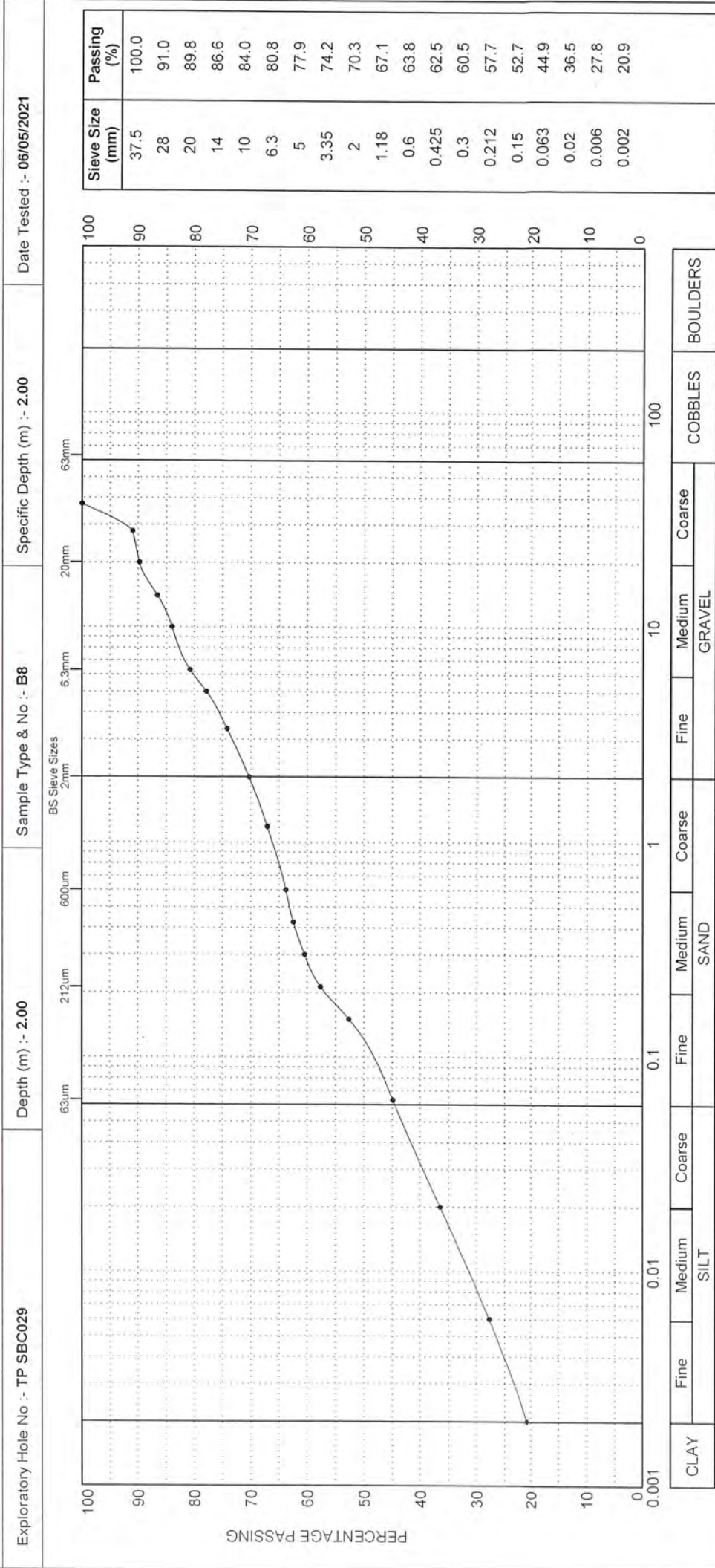


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Slatia Cell Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Ennagh Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 24/05/2021	Certificate No :- PSD/4322A/TP SBC029/B8/2.00	Signature	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1





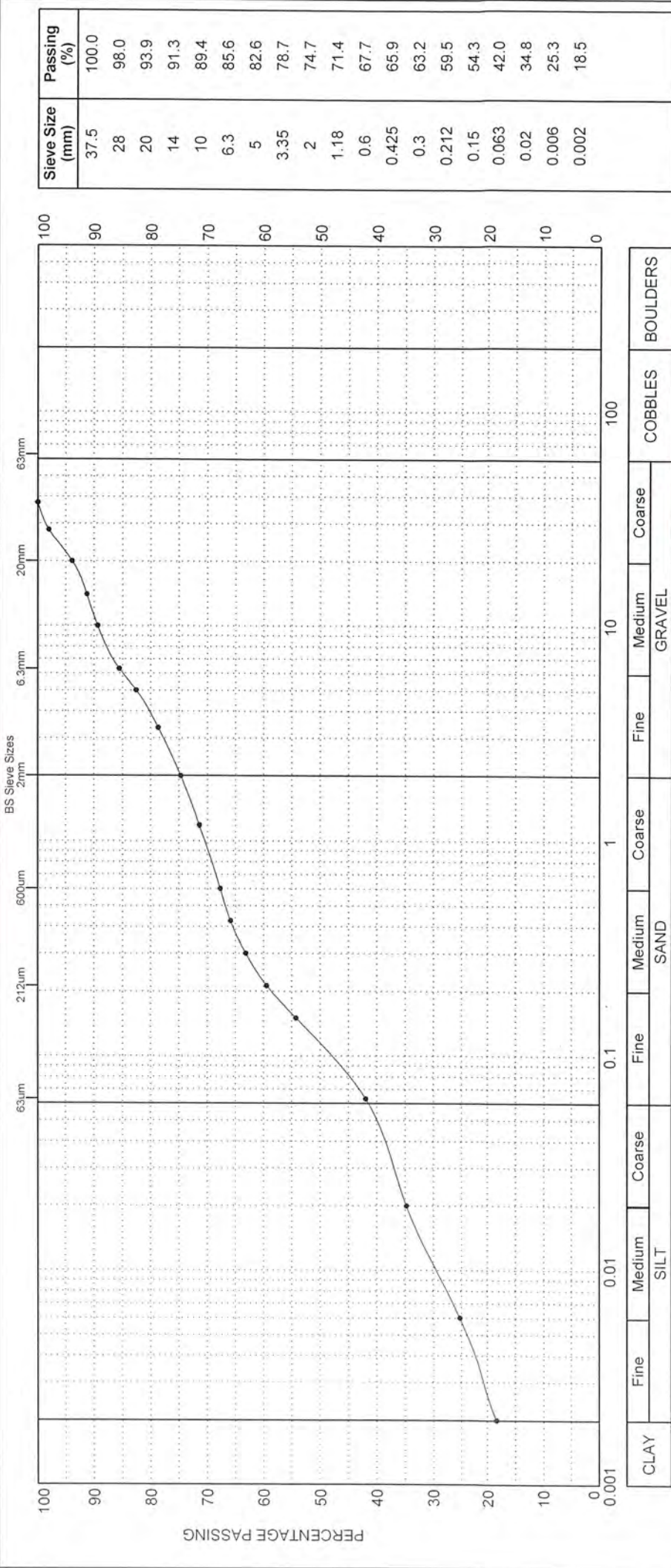
# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stalls Gill Industrial Estate, Pellan Fell, Chesters Street, Co. Durham, DH1  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC030	Depth (m) :- 3.00	Sample Type & No :- B13	Specific Depth (m) :- 3.00
			Date Tested :- 04/05/2021



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 26/05/2021	Certificate No :- PSD/4322A/TP SBC030/B13/3.00	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

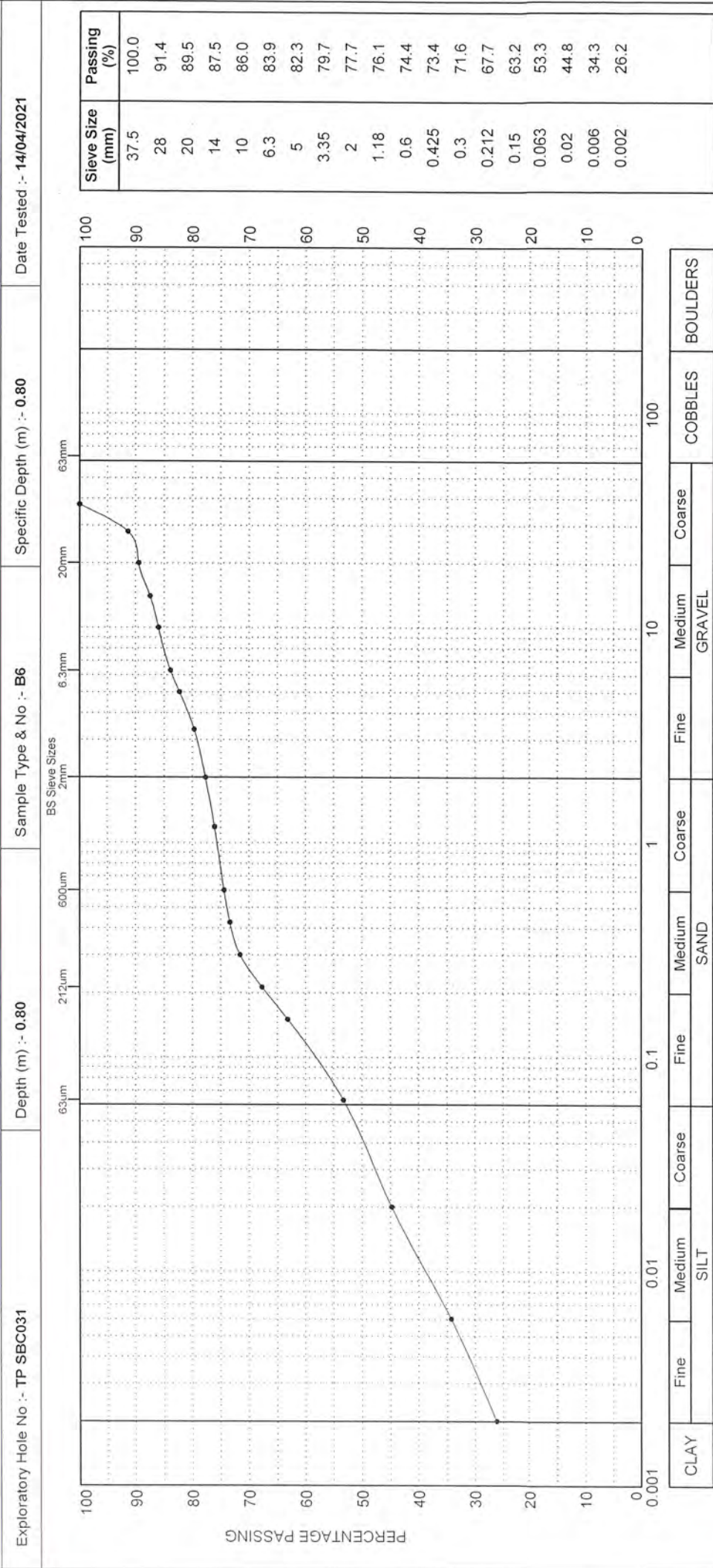


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 26, Salsia City Industrial Estate, Redon Hill, Chesham Street, Co. Durham, DH4  
Regional Office: Unit 20, Business Development Centre, Ewam Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC031/B6/0.80	Signature	Name: M. SELKIRK
Client :- AMEY OW Limited		Contract Title :- A66 North Trans Pennine Scheme C Section 9	
Page 1 of 1		AEG Contract No :- 4322A	



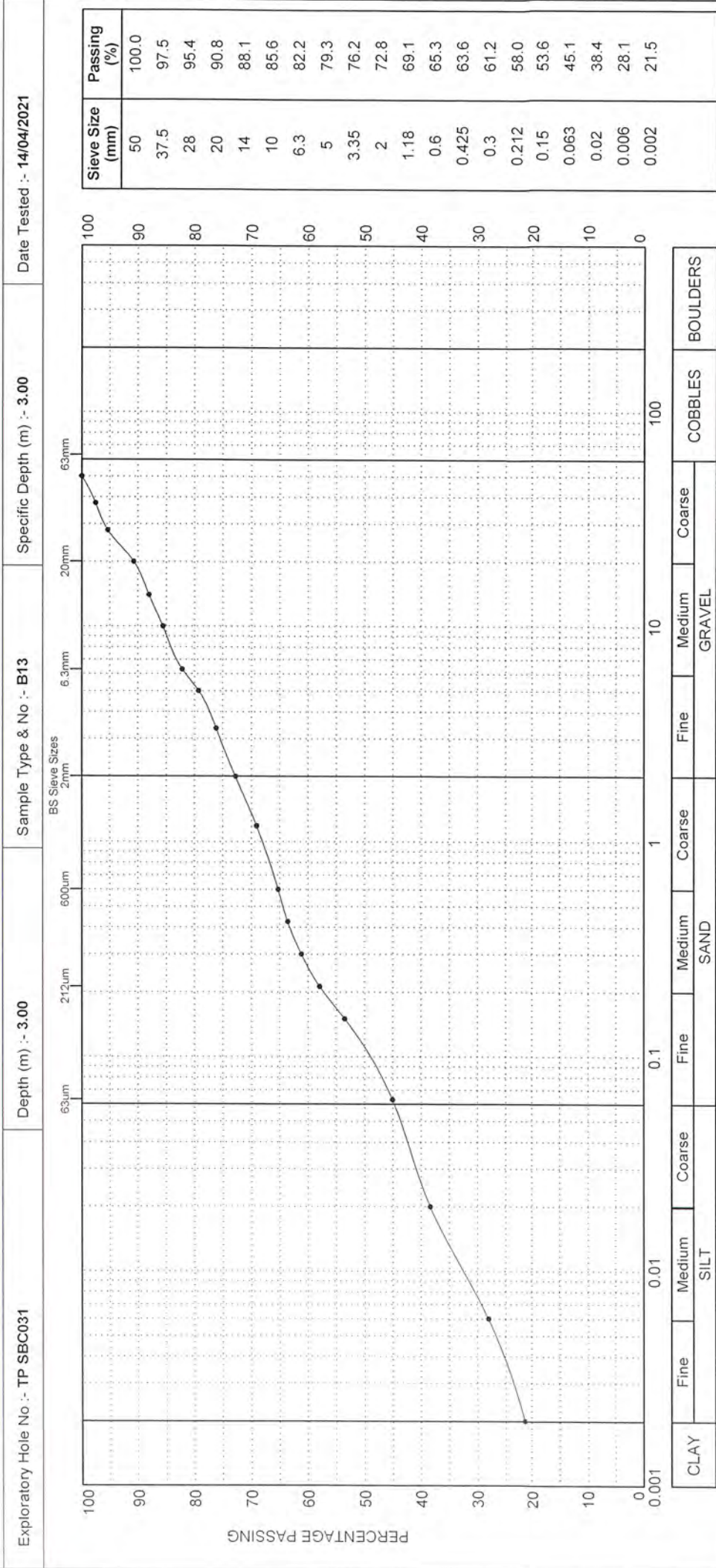


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Cliff Industrial Estate, Pelton Fell, Chesapeake Street, Co. Durham, DH4  
Regional Office: Unit 20, Business Development Centre, Eramon Wharf, Blackburn, BB1 5RU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC031/B13/3.00	Signature	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C-Section 9	AEG Contract No :- 4322A		

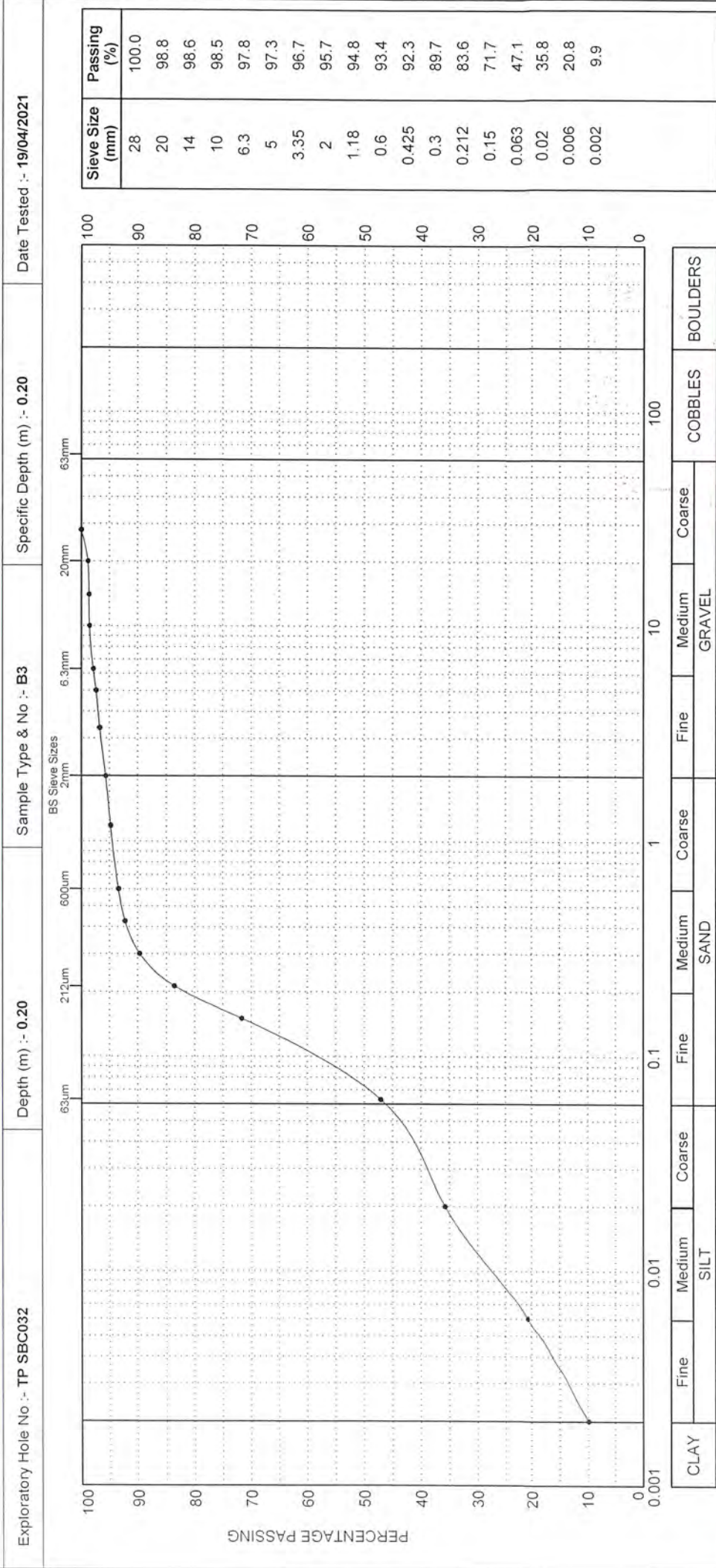


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH4  
Regional Office: Unit 20, Business Development Centre, Earsom Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC032/B3/0.20	Signature	Name :- [Redacted]
Client :- AMEY OW Limited	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	

Page 1 of 1  
AEG Contract No :- 4322A



**M. SELKIRK**



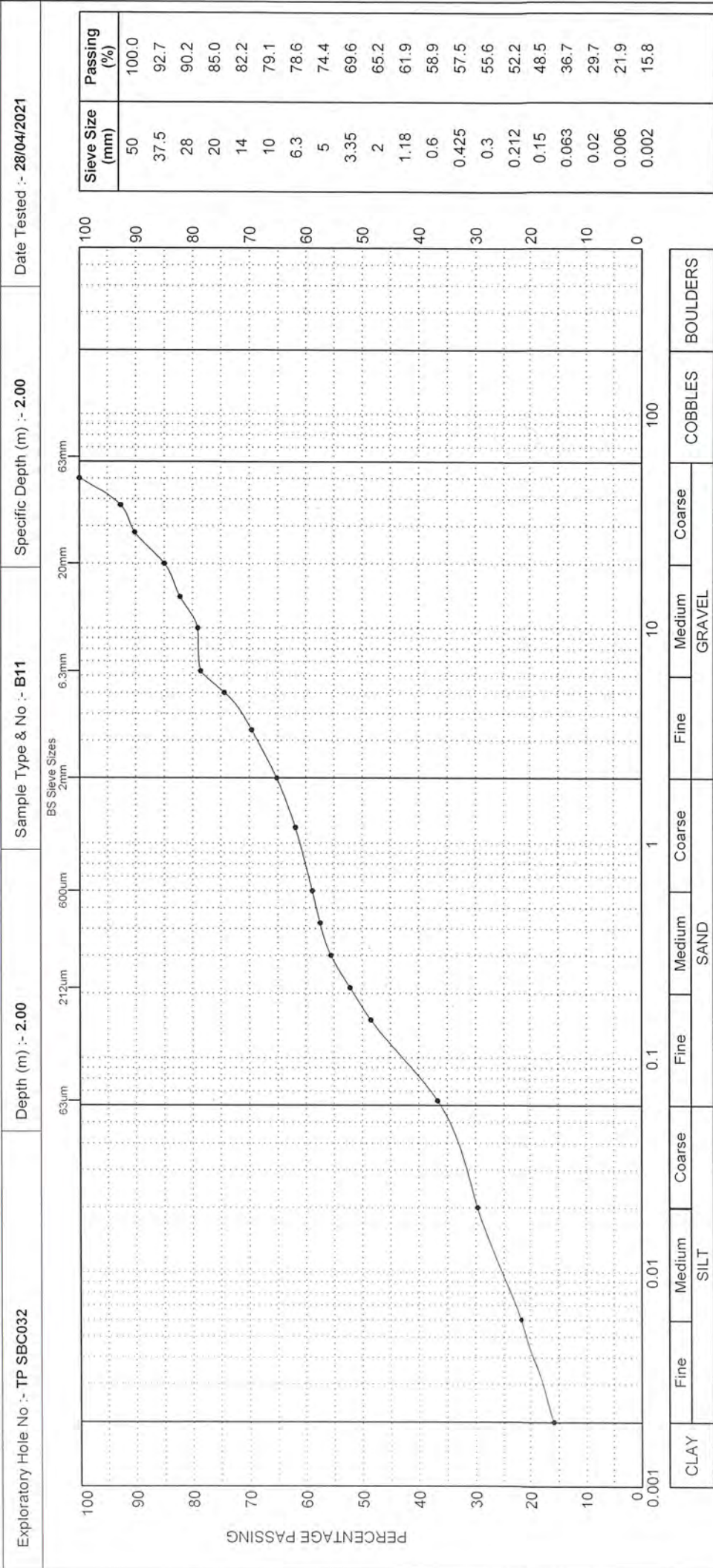


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Oil Industrial Estate, Pelton Fell, Chester-Straid Co. Durham, DH2  
Regional Office: Unit 20 Business Development Centre, Earsom Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



**AMEY**

Date of issue :- 24/05/2021

Certificate No :- PSD/4322A/TP SBC032/B11/2.00

Client :- AMEY OW Limited

Signature :- **M. SELKIRK**

Name :- [Redacted]

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Contract No :- 4322A

For description of sample please refer to the Laboratory Sample Description Sheet

Page 1 of 1

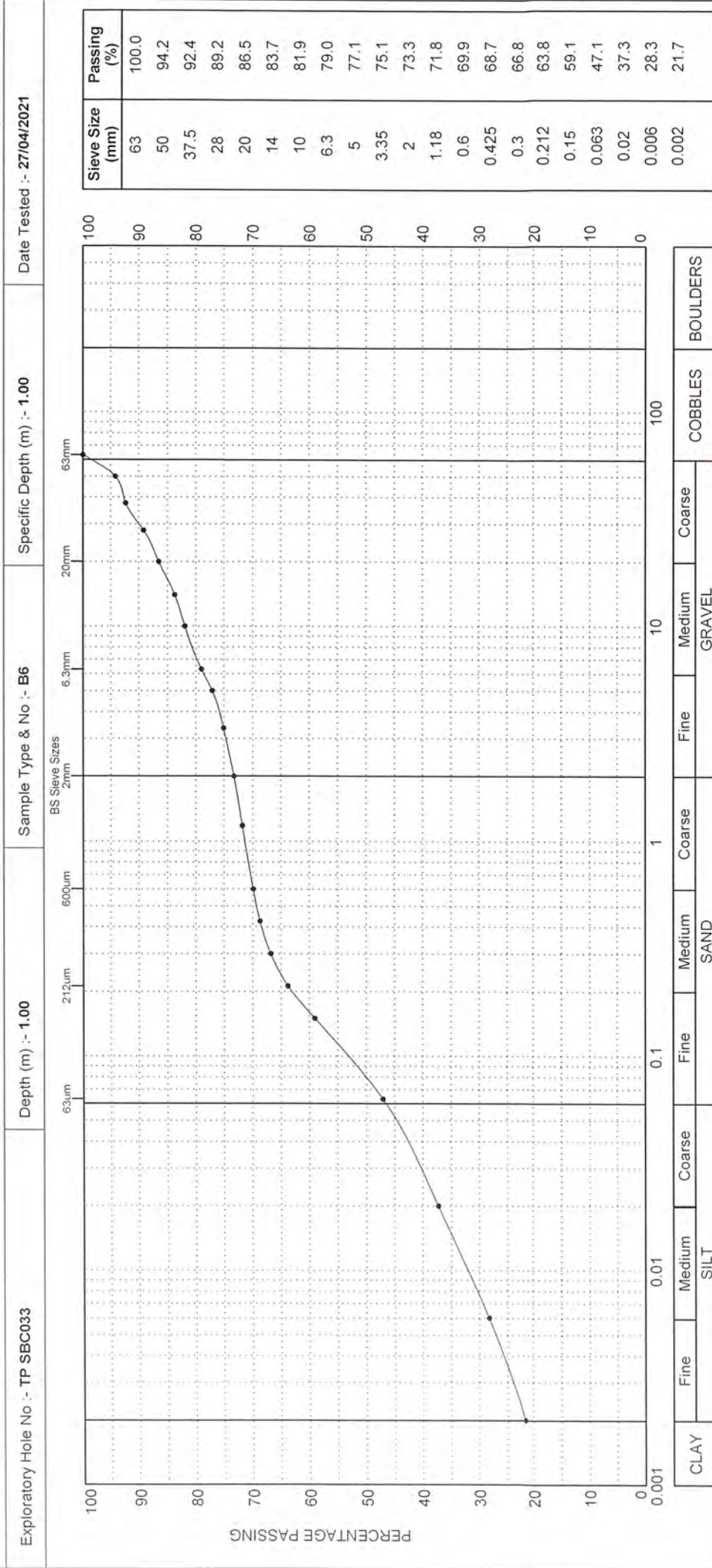
UKAS TESTING 1367

# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25, Salford City Industrial Estate, Parkway Field, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BU

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 24/05/2021	Certificate No :- PSD/4322A/TP SBC033/B6/1.00	Signature	Name :- [Redacted]
Client :- AMEY OW Limited		Contract Title :- A66 North Trans Pennine Scheme C Section 9	
Page 1 of 1		AEG Contract No :- 4322A	





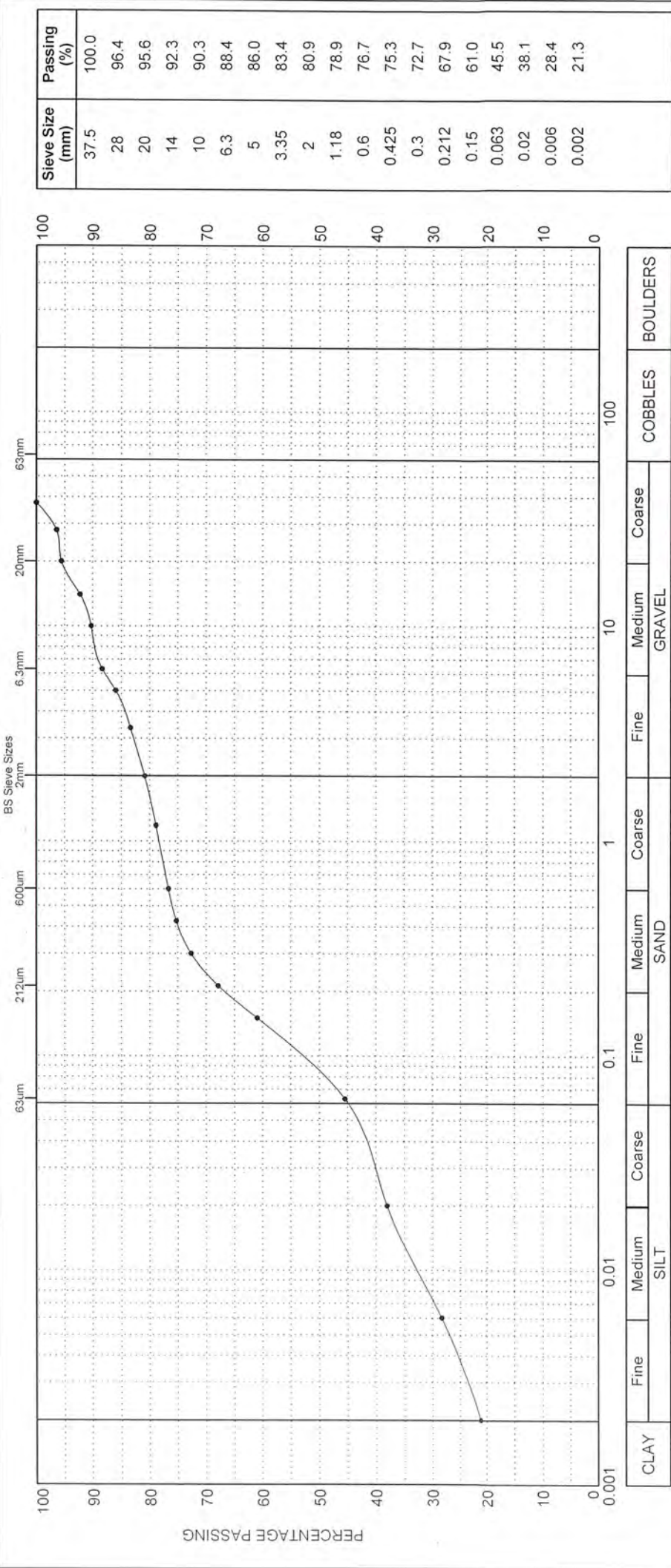
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Skella Gill Industrial Estate, Felton Fell, Chestle-Street, Co. Durham, DH1  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC034	Depth (m) :- 0.70	Sample Type & No :- B4	Specific Depth (m) :- 0.70	Date Tested :- 14/04/2021
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**AMEY**

Date of issue :- 30/04/2021

Certificate No :- PSD/4322A/TP SBC034/B4/0.70

Client :- AMEY OW Limited

Signature: [Redacted]

Name :- **M. SELKIRK**

Contract Title :- A66 North Trans Pennine Scheme C Section 9

AEG Contract No :- 4322A

Page 1 of 1

For description of sample please refer to the Laboratory Sample Description Sheet

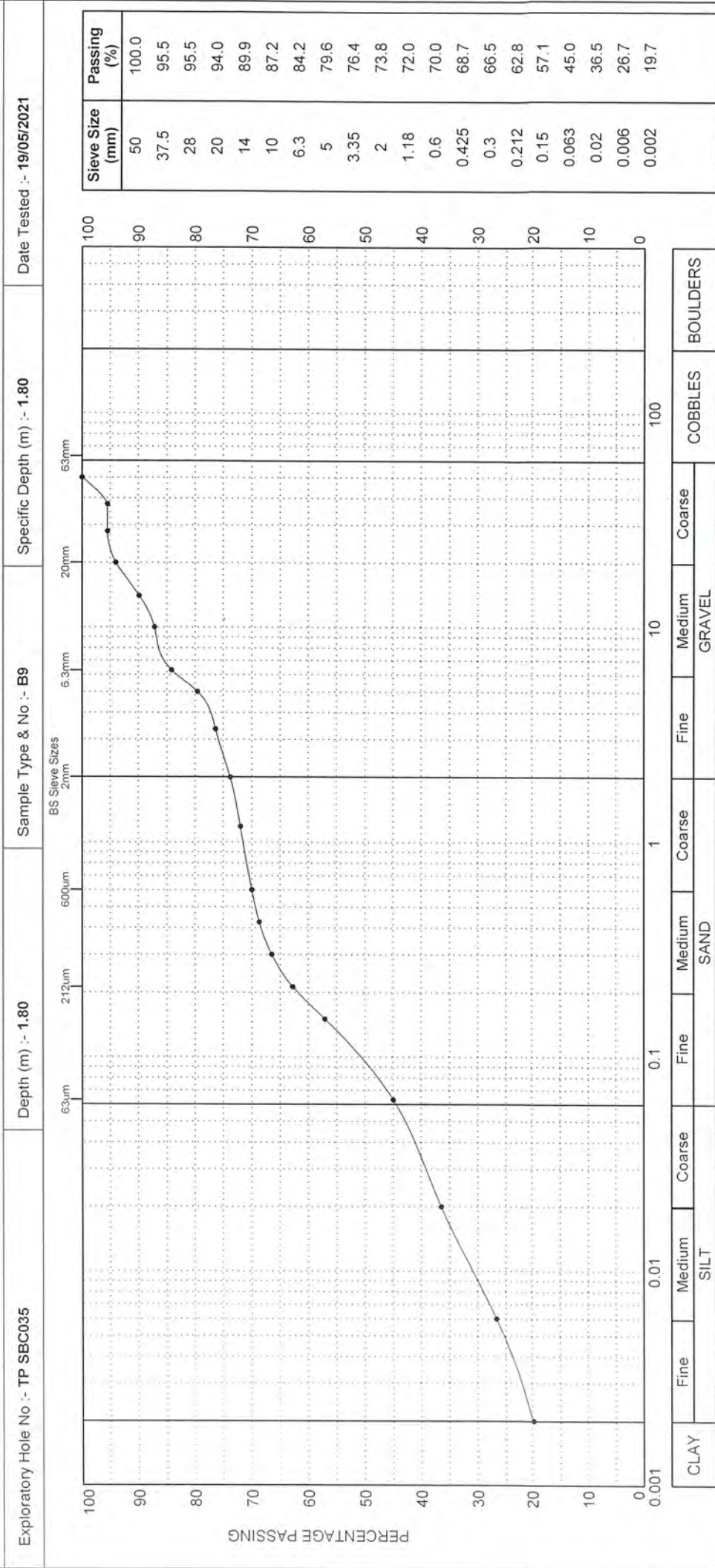


# ALLIED EXPLORATION & GEOTECHNICALS LIMITED

Head Office: Unit 25 Stella Court Industrial Estate, Pilton Fell, Chester-le-Street, Co. Durham, DL10 1JH  
Regional Office: Unit 23, Business Development Centre, Eram Wharf, Backburn, BB1 5FJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC035/B9/1.80	Name :- <b>M. SELKIRK</b>	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	



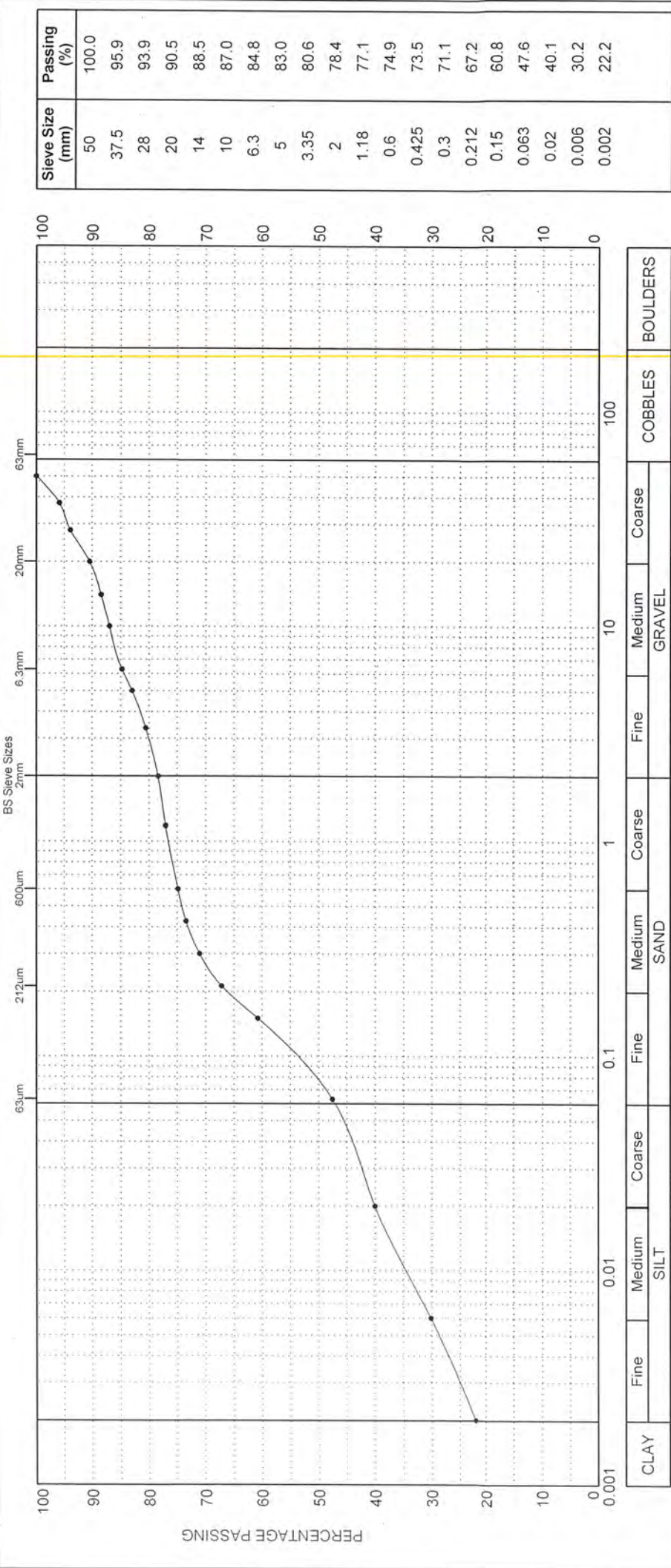
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Palfon Fell, Chester-le-Street, Co. Durham, DH1 1JG  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5B

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

Exploratory Hole No :- TP SBC038	Depth (m) :- 1.00	Sample Type & No :- B5	Specific Depth (m) :- 1.00	Date Tested :- 21/04/2021
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For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC038/B5/1.00	Signature :-	Name :- <b>M. SELKIRK</b>
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A	

Page 1 of 1







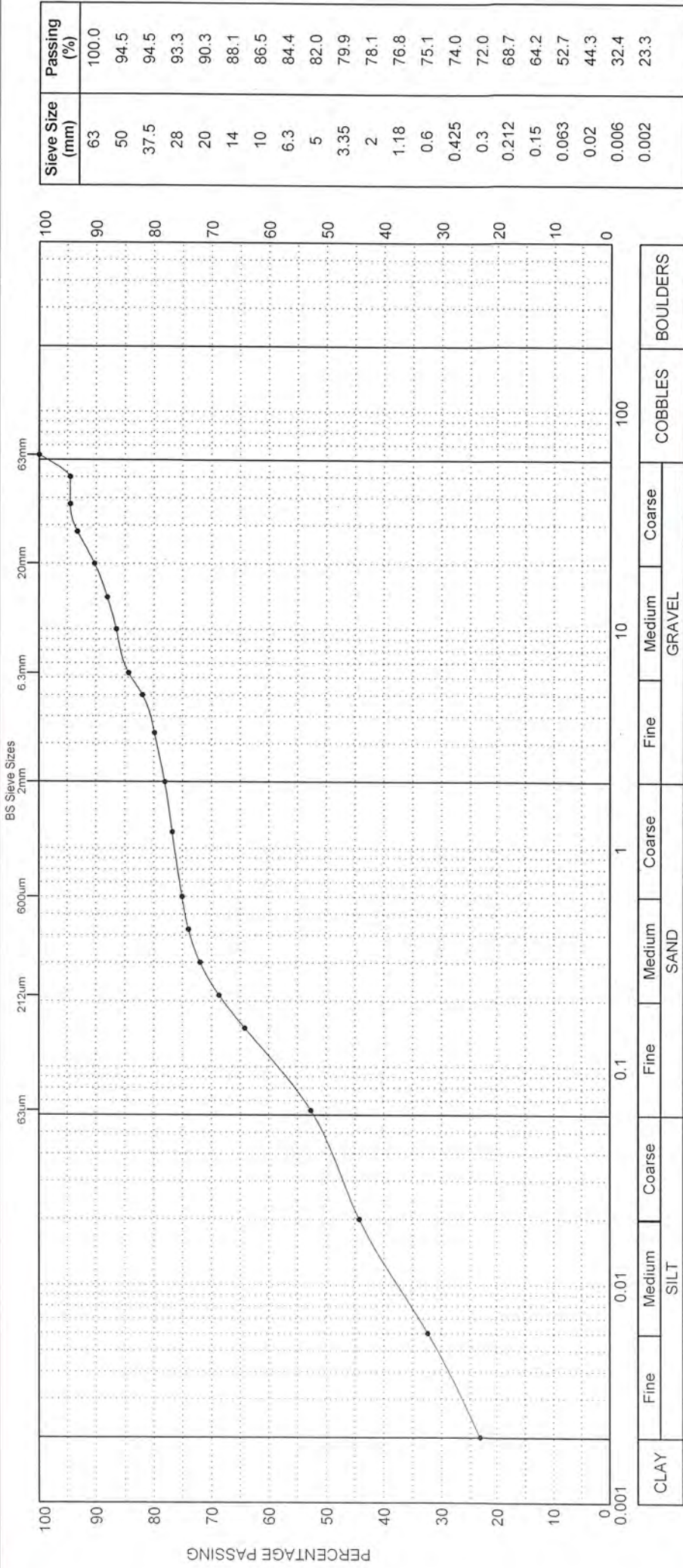
# ALLIED EXPLORATION & GEOTECHNOLOGICALS LIMITED

Head Office: Unit 25, Stella Hill Industrial Estate, Pelton, FE1 6JH, Chester-le-Street, Co. Durham, UK  
Regional Office: Unit 20, Business Development Centre, Epsom Wharf, Blackburn, BB1 5E

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990  
(Test deviated from standard due to insufficient sample mass)

Exploratory Hole No :- TP SBC040      Depth (m) :- 0.80      Sample Type & No :- B4      Specific Depth (m) :- 0.80      Date Tested :- 21/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 27/05/2021	Certificate No :- PSD/4322A/TP SBC040/B4/0.80	Sign
Client :- AMEY OW Limited	Contract Title :-	A66 North Trans Pennine Scheme C Section 9	
		Name :-	Page 1 of 1
		AEG Contract No :- 4322A	

M. SELKIRK



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25, Skella Gill Industrial Estate, Panton Hill, Chesapeake Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990

(Test deviated from standard due to insufficient sample mass)

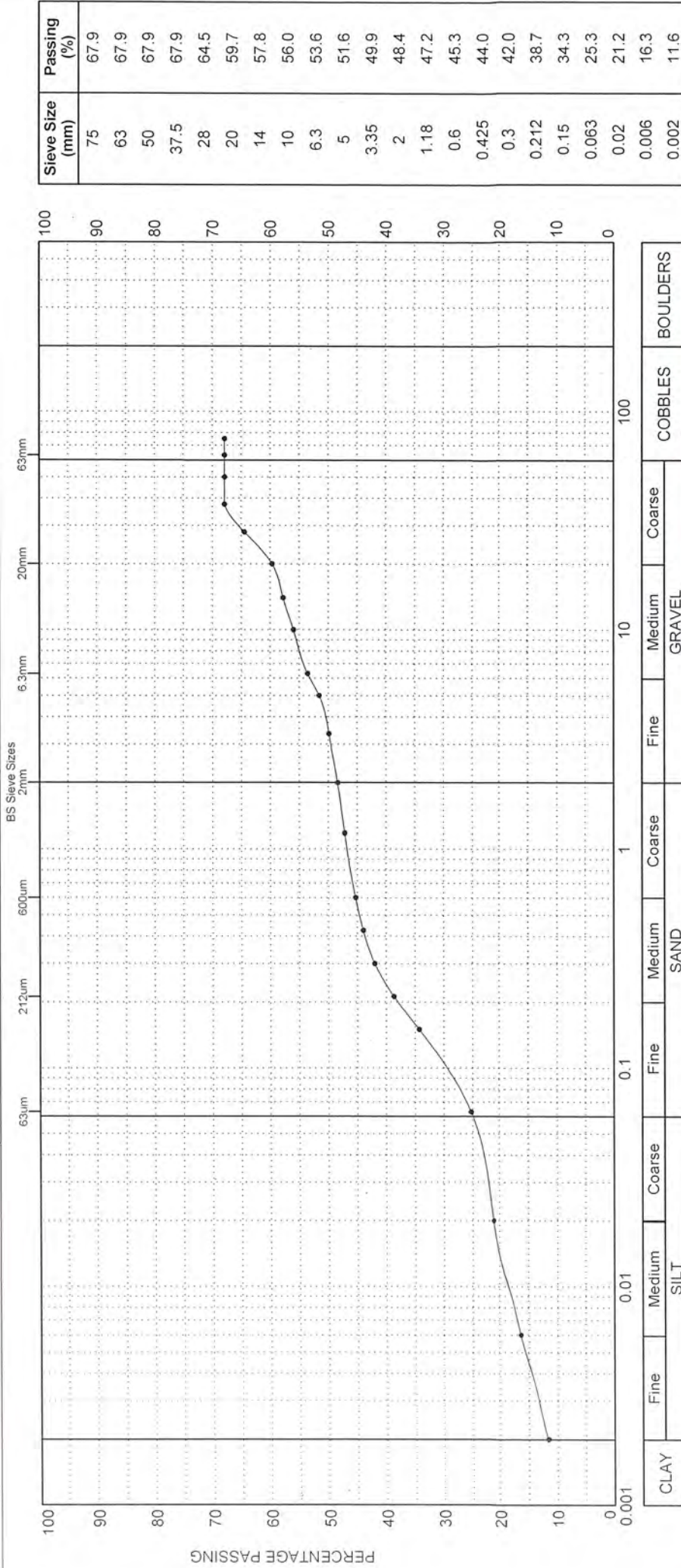
Exploratory Hole No :- TP SBC041A

Depth (m) :- 2.00

Sample Type & No :- B4

Specific Depth (m) :- 2.00

Date Tested :- 20/04/2021



For description of sample please refer to the Laboratory Sample Description Sheet

**W. SELKIRK**  
Name :-



Page 1 of 1  
AEG Contract No :- 4322A

Date of issue :- 30/04/2021  
Certificate No :- PSD/4322A/TP SBC041A/B4/2.00  
Sign

Client :- AMEY OW Limited  
Contract Title :- A66 North Trans Pennine Scheme C Section 9



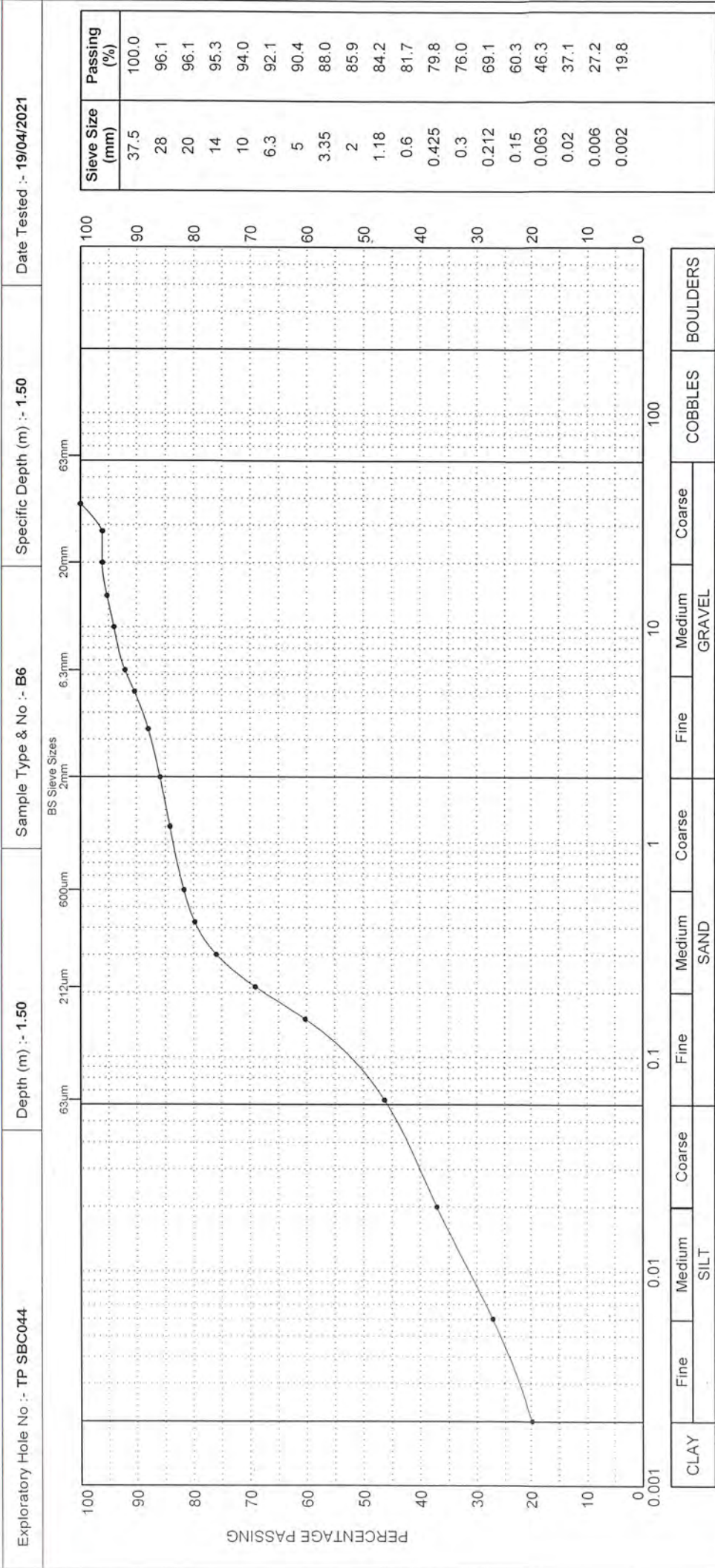


# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Poulton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eram Wharf, Blackburn, BB1 5BJ

## PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

	Date of issue :- 30/04/2021	Certificate No :- PSD/4322A/TP SBC044/B6/1.50	Signature	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		Name :- <b>M. SELKIRK</b>	AEG Contract No :- 4322A

**Determination of Total Sulphur, Sulphate and pH  
(Tested Externally)**





## Certificate of Analysis

*Certificate Number* 21-09604

*Issued:* 18-May-21

*Client* Allied Exploration & Geotechnics Limited  
Unit 25  
Stella Gill Industrial Estate  
Pelton Fell  
DH2 2RG

*Our Reference* 21-09604

*Client Reference* 4332A

*Order No* LA 2500

*Contract Title* A66 North Trans Pennine Scheme C Section 9

*Description* 15 Soil samples.

*Date Received* 07-May-21

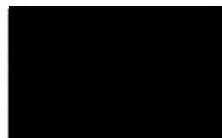
*Date Started* 07-May-21

*Date Completed* 18-May-21

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*



Adam Fenwick  
Contracts Manager





# Summary of Chemical Analysis Soil Samples

Our Ref 21-09604

Client Ref 4332A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1843594	1843595	1843596	1843597	1843598	1843599	1843600	1843601	1843602	1843603	1843604
Sample ID	BH SBC006	BH SBC008	BH SBC008	BH SBC014A	BH SBC014A	BH SBC024	BH SBC026	BH SBC029	TP SBC002	TP SBC012A	TP SBC021
Depth	3.00	1.70	3.00	18.30	22.80	5.40	1.00	2.50	2.50	4.20	1.20
Other ID	13	9	13	32	35	19	6	10	9	14	7
Sample Type	ES	ES	ES	C	C	ES	ES	ES	ES	ES	ES
Sampling Date	24/02/2021	23/02/2021	23/02/2021	09/03/2021	10/03/2021	10/03/2021	09/03/2021	03/03/2021	26/02/2021	24/02/2021	02/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
Inorganics			
pH	DETSC 2008#		pH
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%





# Summary of Chemical Analysis Soil Samples

Our Ref 21-09604

Client Ref 4332A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1843605	1843606	1843607	1846469
Sample ID	TP SBC031	TP SBC039	TP SBC039	BH SBC020
Depth	1.20	1.00	2.50	5.00
Other ID	7	5	8	18
Sample Type	ES	ES	ES	ES
Sampling Date	26/02/2021	05/03/2021	05/03/2021	07/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
<b>Inorganics</b>			
pH	DETSC 2008#		pH
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%

## Information in Support of the Analytical Results

Our Ref 21-09604

Client Ref 4332A

Contract A66 North Trans Pennine Scheme C Section 9

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1843594	BH SBC006 3.00 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843595	BH SBC008 1.70 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843596	BH SBC008 3.00 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843597	BH SBC014A 18.30 SOIL	09/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843598	BH SBC014A 22.80 SOIL	10/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843599	BH SBC024 5.40 SOIL	10/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843600	BH SBC026 1.00 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843601	BH SBC029 2.50 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843602	TP SBC002 2.50 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843603	TP SBC012A 4.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843604	TP SBC021 1.20 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843605	TP SBC031 1.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843606	TP SBC039 1.00 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1843607	TP SBC039 2.50 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1846469	BH SBC020 5.00 SOIL	07/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.



## Information in Support of the Analytical Results

*Our Ref* 21-09604

*Client Ref* 4332A

*Contract* A66 North Trans Pennine Scheme C Section 9

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 21-10023

*Issued:* 18-May-21

*Client* Allied Exploration & Geotechnics Limited  
Unit 25  
Stella Gill Industrial Estate  
Pelton Fell  
DH2 2RG

*Our Reference* 21-10023

*Client Reference* 4322A

*Order No* LA 2500

*Contract Title* A66 North Trans Pennine Scheme C Section 9

*Description* 48 Soil samples.

*Date Received* 12-May-21

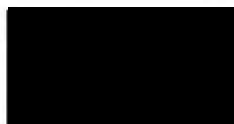
*Date Started* 12-May-21

*Date Completed* 18-May-21

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*



Adam Fenwick  
Contracts Manager







# Summary of Chemical Analysis Soil Samples

Our Ref 21-10023

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1845910	1845911	1845912	1845913	1845914	1845915	1845916	1845917	1845918	1845919	1845920
.Sample ID	BH SBC005	BH SBC005	BH SBC006	BH SBC007	BH SBC007	BH SBC008	BH SBC011	BH SBC011	BH SBC012	BH SBC012	BH SBC012
Depth	1.00	2.50	1.20	1.00	2.00	4.00	2.30	4.30	5.80	6.90	8.50
Other ID	5	9	7	5	10	15	10	16	26	29	33
Sample Type	J	J	J	J	J	J	J	J	J	J	J
Sampling Date	25/02/2021	25/02/2021	23/02/2021	01/03/2021	01/03/2021	23/02/2021	25/02/2021	25/02/2021	24/02/2021	24/02/2021	24/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
Inorganics			
pH	DETS 2008#		pH
Sulphate Aqueous Extract as SO4	DETS 2076#	10	mg/l
Sulphur as S, Total	DETS 2320	0.01	%
Sulphate as SO4, Total	DETS 2321#	0.01	%

	7.9	8.1	7.8	7.7	7.5	8.0	8.0	8.1	7.8	7.9	7.8
	78	36	63	75	22	49	180	550	1600	1300	340
	0.01	0.04	0.03	0.02	0.05	0.19	0.37	0.09	0.44	0.40	0.43
	0.05	0.03	0.04	0.05	0.05	0.09	0.10	0.07	0.15	0.16	0.20



# Summary of Chemical Analysis Soil Samples

Our Ref 21-10023

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1845921	1845922	1845923	1845924	1845925	1845926	1845927	1845928	1845929	1845930	1845931
Sample ID	BH SBC013	BH SBC013	BH SBC013	BH SBC014A	BH SBC014A	BH SBC015	BH SBC020	BH SBC020	BH SBC021	BH SBC023A	BH SBC023A
Depth	6.00	8.20	9.00	5.20	6.70	7.50	1.00	4.00	1.90	1.70	4.80
Other ID	20	27	29	16	20	21	6	16	10	10	18
Sample Type	J	J	J	J	J	J	J	J	J	J	J
Sampling Date	08/03/2021	08/03/2021	08/03/2021	23/02/2021	23/02/2021	25/02/2021	07/03/2021	07/03/2021	10/03/2021	02/03/2021	02/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
Inorganics			
pH	DETS 2008#		pH
Sulphate Aqueous Extract as SO4	DETS 2076#	10	mg/l
Sulphur as S, Total	DETS 2320	0.01	%
Sulphate as SO4, Total	DETS 2321#	0.01	%





# Summary of Chemical Analysis Soil Samples

Our Ref 21-10023

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1845932	1845933	1845934	1845935	1845936	1845937	1845938	1845939	1845940	1845941	1845942
Sample ID	BH SBC023A	BH SBC023A	BH SBC023A	BH SBC024	BH SBC024	BH SBC026	BH SBC026	BH SBC029	BH SBC029	BH SBC030	BH SBC030
Depth	6.50	10.70	16.20	2.50	4.00	2.00	3.40	1.00	1.20	1.00	1.20
Other ID	21	28	38	9	13	9	14	5	7	6	8
Sample Type	J	B	J	J	J	J	J	J	J	J	J
Sampling Date	02/03/2021	02/03/2021	02/03/2021	10/03/2021	10/03/2021	09/03/2021	09/03/2021	03/03/2021	03/03/2021	04/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
Inorganics			
pH	DETSC 2008#		pH
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%



# Summary of Chemical Analysis Soil Samples

Our Ref 21-10023

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1845943	1845944	1845945	1845946	1845947	1845948	1845949	1845950	1845951	1845952	1845953
Sample ID	TP SBC002	TP SBC003	TP SBC003	TP SBC010	TP SBC012A	TP SBC013	TP SBC014	TP SBC017	TP SBC027	TP SBC028	TP SBC028
Depth	1.30	0.90	2.90	1.50	1.00	3.50	2.00	2.50	2.50	0.70	3.00
Other ID	6	5	11	7	1	11	10	12	9	5	12
Sample Type	J	J	J	J	J	J	J	J	J	J	J
Sampling Date	26/02/2021	26/02/2021	26/02/2021	23/02/2021	24/02/2021	03/02/2021	24/02/2021	01/03/2021	25/02/2021	25/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test Method LOD Units

Test	Method	LOD	Units
Inorganics			
pH	DETSC 2008#		pH
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%





# Summary of Chemical Analysis Soil Samples

Our Ref 21-10023

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1845954	1845955	1845956	1845957
TP SBC031	TP SBC032	TP SBC041A	TP SBC041A	TP SBC041A
Depth	2.80	1.00	1.50	3.00
Other ID	12	6	3	8
Sample Type	J	J	J	J
Sampling Date	26/02/2021	09/03/2021	09/03/2021	09/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units
<b>Inorganics</b>			
pH	DETSC 2008#		pH
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l
Sulphur as S, Total	DETSC 2320	0.01	%
Sulphate as SO4, Total	DETSC 2321#	0.01	%

## Information in Support of the Analytical Results

Our Ref 21-10023

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

### Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1845910	BH SBC005 1.00 SOIL	25/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845911	BH SBC005 2.50 SOIL	25/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845912	BH SBC006 1.20 SOIL	23/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845913	BH SBC007 1.00 SOIL	01/03/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845914	BH SBC007 2.00 SOIL	01/03/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845915	BH SBC008 4.00 SOIL	23/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845916	BH SBC011 2.30 SOIL	25/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845917	BH SBC011 4.30 SOIL	25/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845918	BH SBC012 5.80 SOIL	24/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845919	BH SBC012 6.90 SOIL	24/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845920	BH SBC012 8.50 SOIL	24/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845921	BH SBC013 6.00 SOIL	08/03/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845922	BH SBC013 8.20 SOIL	08/03/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845923	BH SBC013 9.00 SOIL	08/03/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845924	BH SBC014A 5.20 SOIL	23/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845925	BH SBC014A 6.70 SOIL	23/02/21		PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	



## Information in Support of the Analytical Results

Our Ref 21-10023

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1845926	BH SBC015 7.50 SOIL	25/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845927	BH SBC020 1.00 SOIL	07/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845928	BH SBC020 4.00 SOIL	07/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845929	BH SBC021 1.90 SOIL	10/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845930	BH SBC023A 1.70 SOIL	02/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845931	BH SBC023A 4.80 SOIL	02/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845932	BH SBC023A 6.50 SOIL	02/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845933	BH SBC023A 10.70 SOIL	02/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845934	BH SBC023A 16.20 SOIL	02/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845935	BH SBC024 2.50 SOIL	10/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845936	BH SBC024 4.00 SOIL	10/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845937	BH SBC026 2.00 SOIL	09/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845938	BH SBC026 3.40 SOIL	09/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845939	BH SBC029 1.00 SOIL	03/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845940	BH SBC029 1.20 SOIL	03/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845941	BH SBC030 1.00 SOIL	04/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845942	BH SBC030 1.20 SOIL	04/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	

## Information in Support of the Analytical Results

Our Ref 21-10023

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1845943	TP SBC002 1.30 SOIL	26/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845944	TP SBC003 0.90 SOIL	26/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845945	TP SBC003 2.90 SOIL	26/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845946	TP SBC010 1.50 SOIL	23/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845947	TP SBC012A 1.00 SOIL	24/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845948	TP SBC013 3.50 SOIL	03/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845949	TP SBC014 2.00 SOIL	24/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845950	TP SBC017 2.50 SOIL	01/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845951	TP SBC027 2.50 SOIL	25/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845952	TP SBC028 0.70 SOIL	25/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845953	TP SBC028 3.00 SOIL	25/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845954	TP SBC031 2.80 SOIL	26/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845955	TP SBC032 1.00 SOIL	26/02/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845956	TP SBC041A 1.50 SOIL	09/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	
1845957	TP SBC041A 3.00 SOIL	09/03/21	PT 500ml	Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), pH + Conductivity (7 days)	



## Information in Support of the Analytical Results

Our Ref 21-10023

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425 $\mu$ m sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

## Determination of Dry Density/Moisture Content Relationship





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- BH SBC005

Depth (m) :- 0.00

Sample Type & No :- B3

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 13

Particle Density (Measured) = 2.57

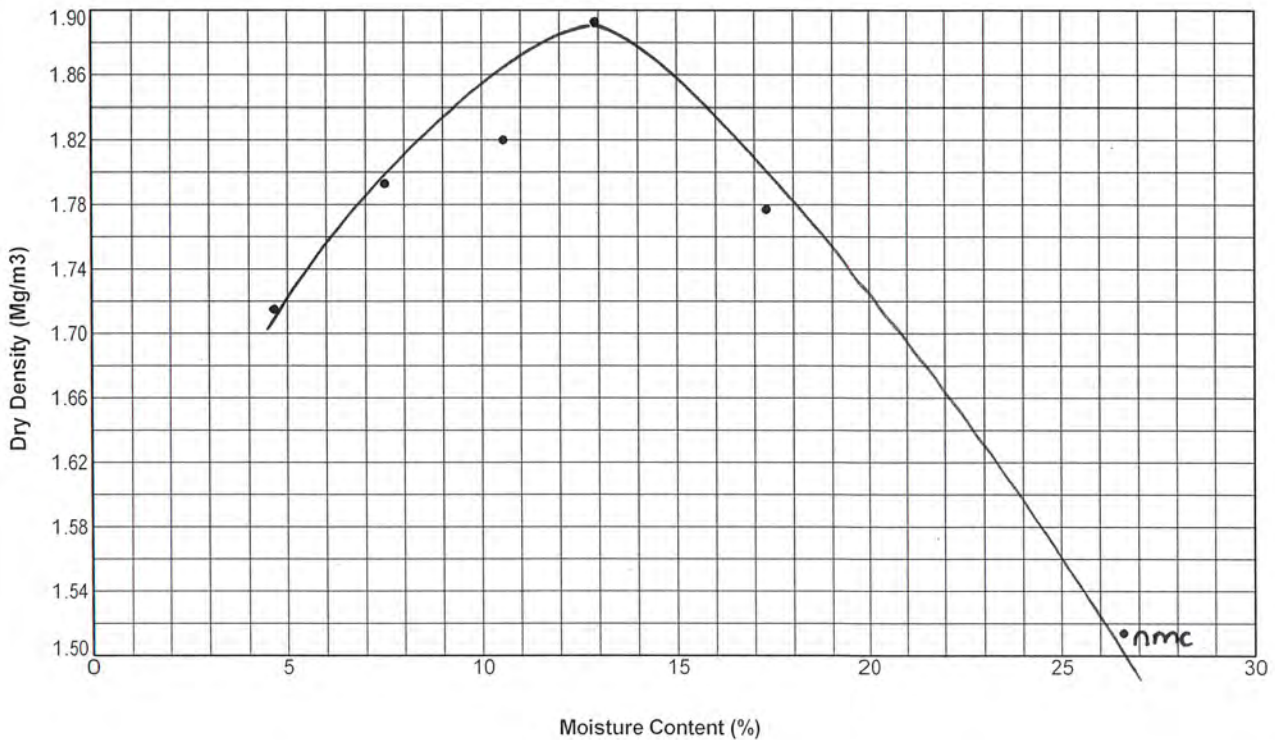
Maximum Dry Density (Mg/m<sup>3</sup>) = 1.89

Retained on 20mm Sieve (%) = 14.1

Date Tested = 21/04/2021

Retained on 37.5mm Sieve (%) = 9.7

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signature

[Redacted Signature]

Name :-

M. SELKIRK

Page 1 of 1

Date

17/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH8 7JH  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5B

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- **BH SBC007**

Depth (m) :- **2.00**

Sample Type & No :- **B11**

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = **14**

Particle Density (Measured) = **2.65**

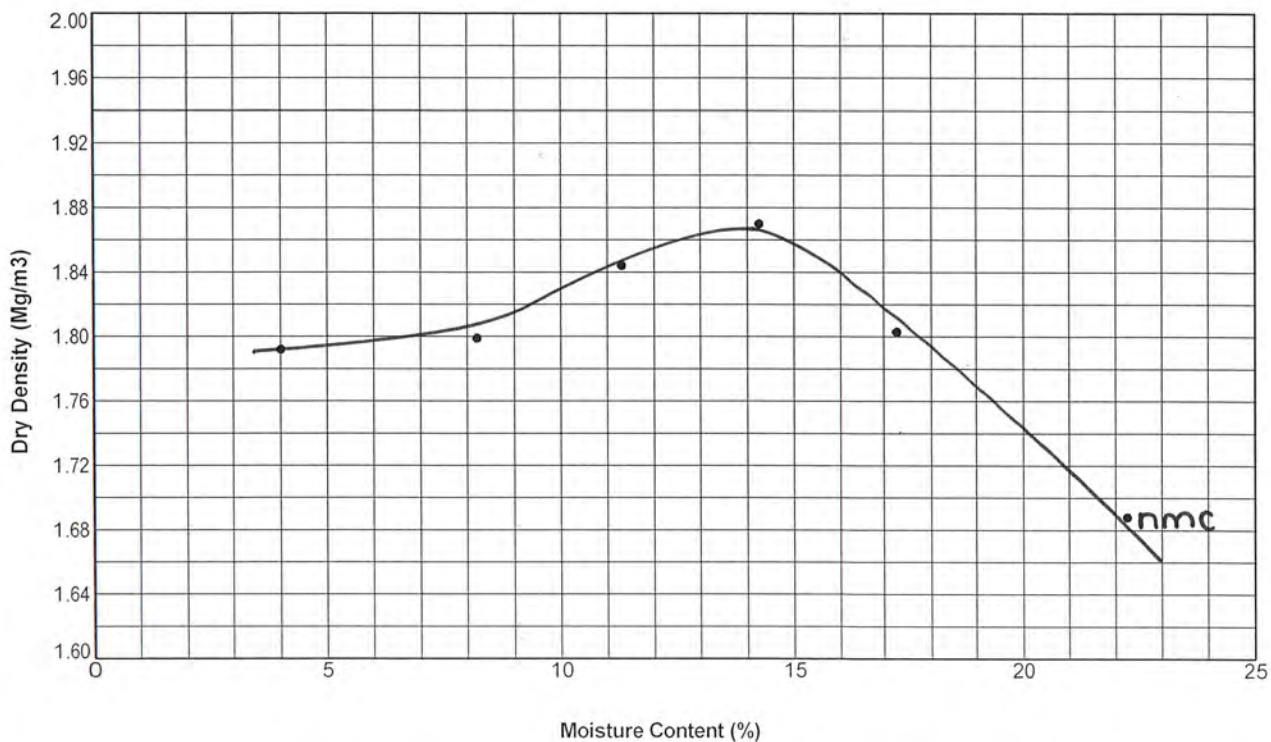
Maximum Dry Density (Mg/m<sup>3</sup>) = **1.87**

Retained on 20mm Sieve (%) = **1.1**

Date Tested = **05/05/2021**

Retained on 37.5mm Sieve (%) = **1.1**

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

24/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH8 7JH  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5RQ

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

### Specimen Identification

Exploratory Hole No :- BH SBC012

Depth (m) :- 5.20

Sample Type & No :- B24

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 8.5

Particle Density (Measured) = 2.53

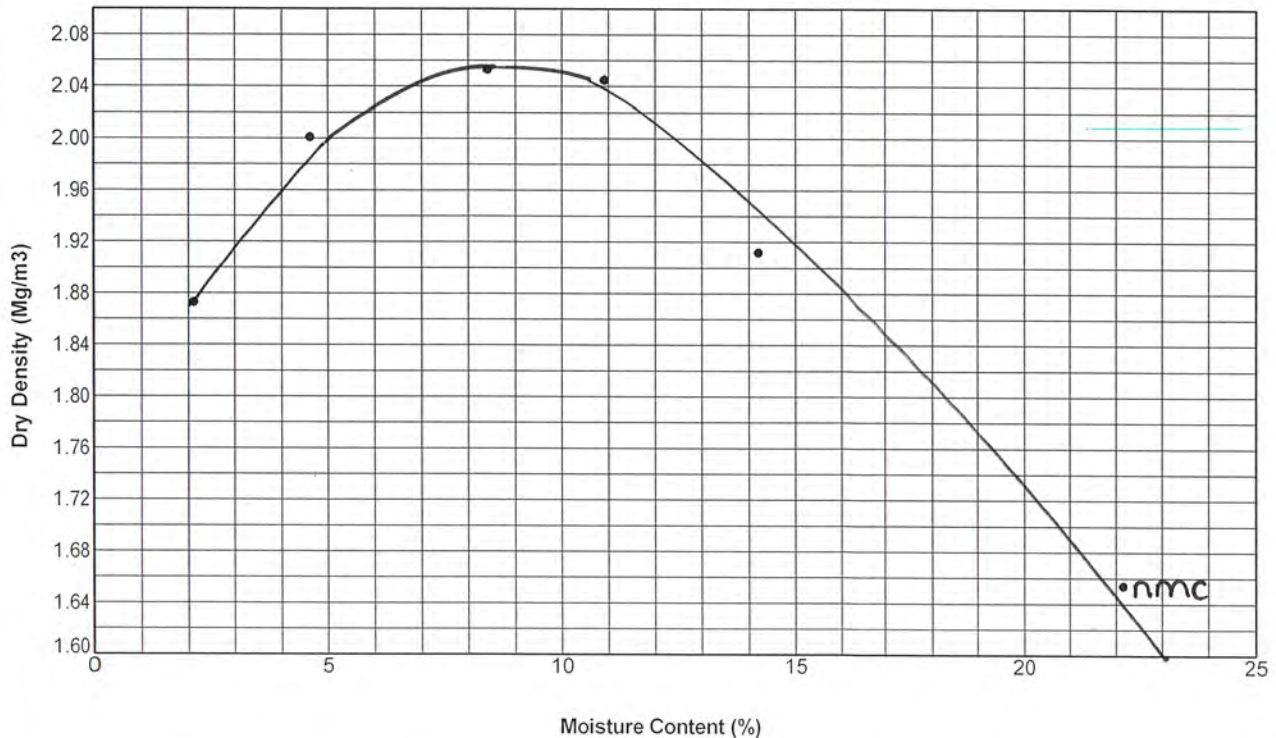
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.05

Retained on 20mm Sieve (%) = 33.1

Date Tested = 05/05/2021

Retained on 37.5mm Sieve (%) = 28.6

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed

Date of

24/05/2021

Name :-

**M. SELKIRK**

Certificate No :-

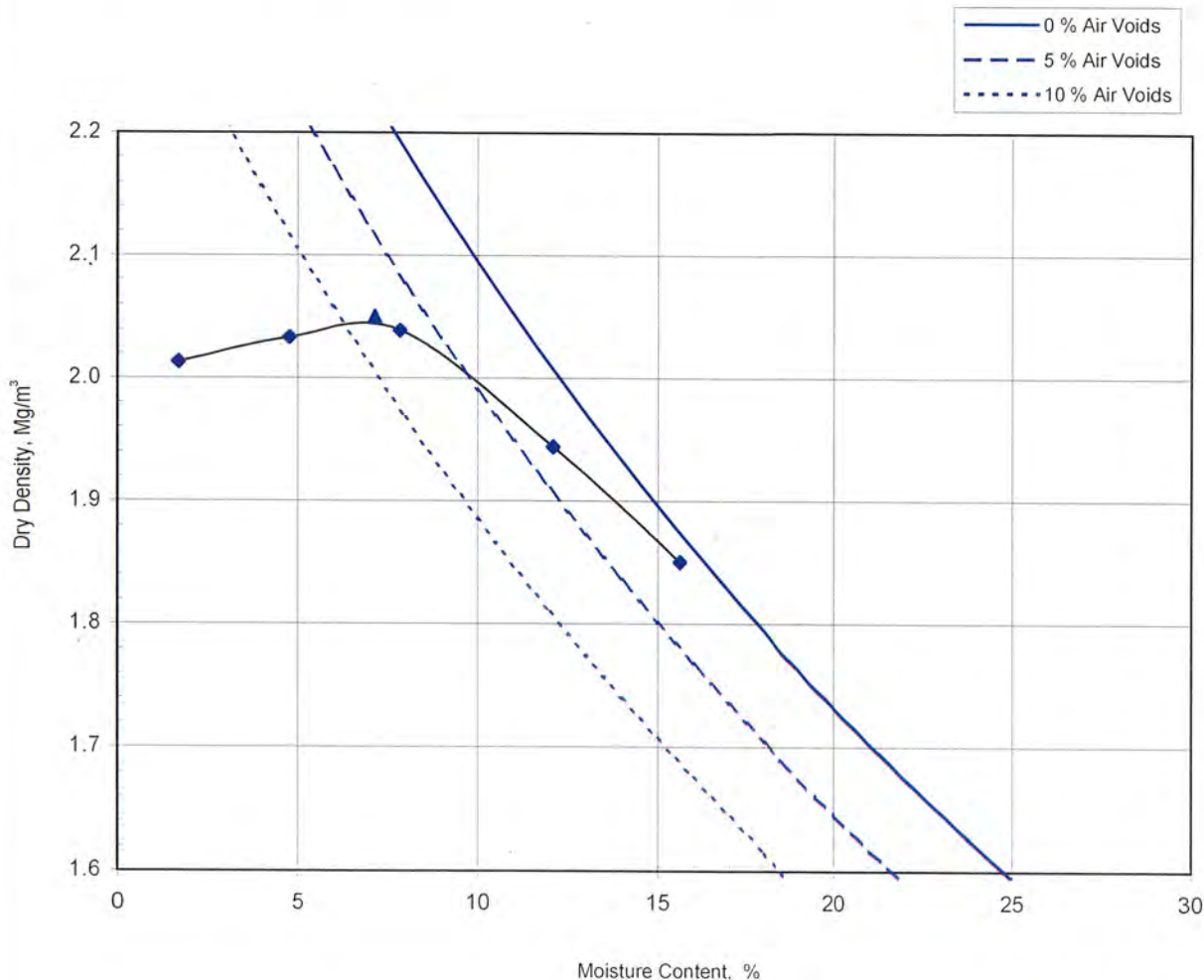
COMP/4322A/1

AEG Contract No. :-

4322A

Page 1 of 1





Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 0
Mass Retained on 20.0 mm Sieve	% 0
Particle Density - Measured	Mg/m³ 2.65
Natural Moisture Content	% 19
Maximum Dry Density	Mg/m³ 2.05
Optimum Moisture Content	% 7.2

Originator	Checked & Approved	<b>Moisture Content / Dry Density Relationship</b> BS1377:Part 4:1990 Clause 3.5
BJ	[Redacted]	





Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9

Contract No **A13955**

Client Allied Exploration & Geotechnics Limited

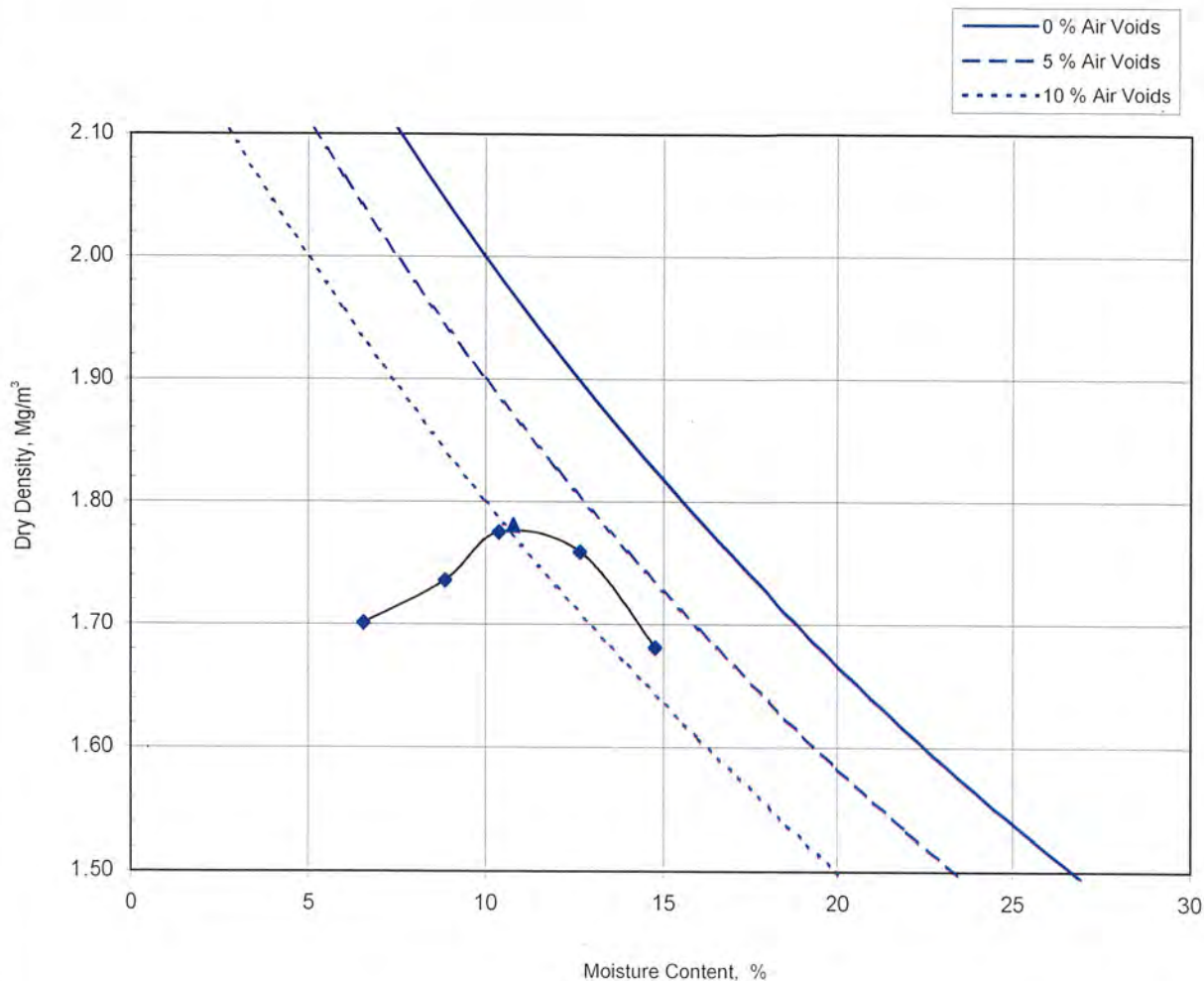
Hole BH SBC021

Engineer


Sample Ref

Depth (m) 0.05

Sample Type B2



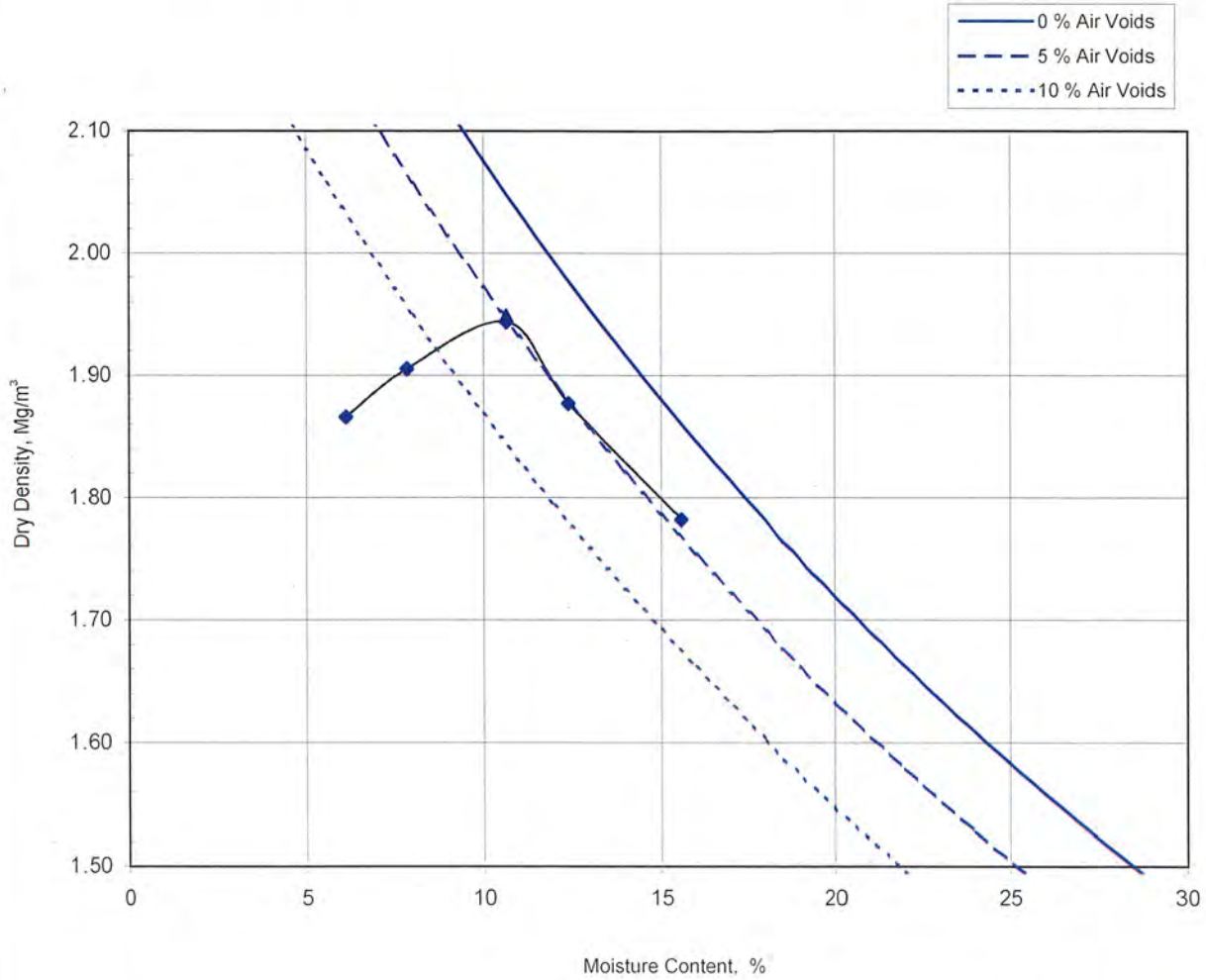
Non Engineering Description	Brown clayey very garvelly very sandy SILT. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 0
Mass Retained on 20.0 mm Sieve	% 4
Particle Density - Measured	Mg/m³ 2.50
Natural Moisture Content	% 31
Maximum Dry Density	Mg/m³ 1.78
Optimum Moisture Content	% 10.8

Originator	Checked & Approved
BJ	 01/06/2021

### Moisture Content / Dry Density Relationship

BS1377:Part 4:1990 Clause 3.5





Non Engineering Description	Brown clayey gravelly very sandy SILT. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 0
Mass Retained on 20.0 mm Sieve	% 3
Particle Density - Measured	Mg/m³ 2.62
Natural Moisture Content	% 33
Maximum Dry Density	Mg/m³ 1.95
Optimum Moisture Content	% 10.7

Originator	Checked & Approved
SK	[Redacted]

**Moisture Content / Dry Density Relationship**  
 BS1377:Part 4:1990 Clause 3.5

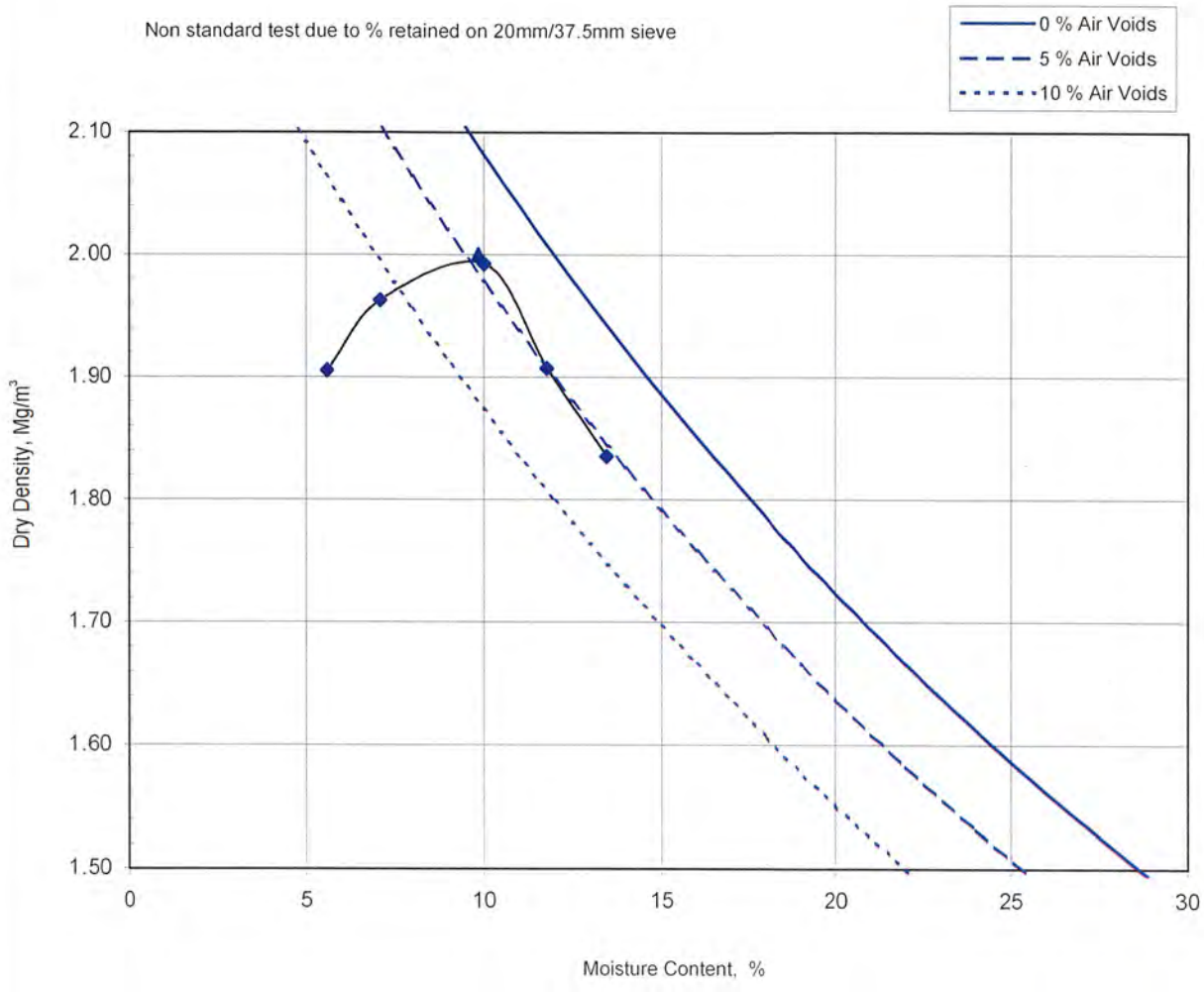




**TERRA TEK**  
SITE INVESTIGATION AND LABORATORY SERVICES

Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
Client Allied Exploration & Geotechnics Limited  
Engineer

Contract No **A13955**  
Hole BH SBC026  
Sample Ref  
Depth (m) 2.30  
Sample Type B12



Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse	
Preparation	Oven dried	
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles	
Samples Used	Single	
Mass Retained on 37.5 mm Sieve	%	16
Mass Retained on 20.0 mm Sieve	%	23
Particle Density - Measured	Mg/m <sup>3</sup>	2.63
Natural Moisture Content	%	12
Maximum Dry Density	Mg/m <sup>3</sup>	2.00
Optimum Moisture Content	%	9.8

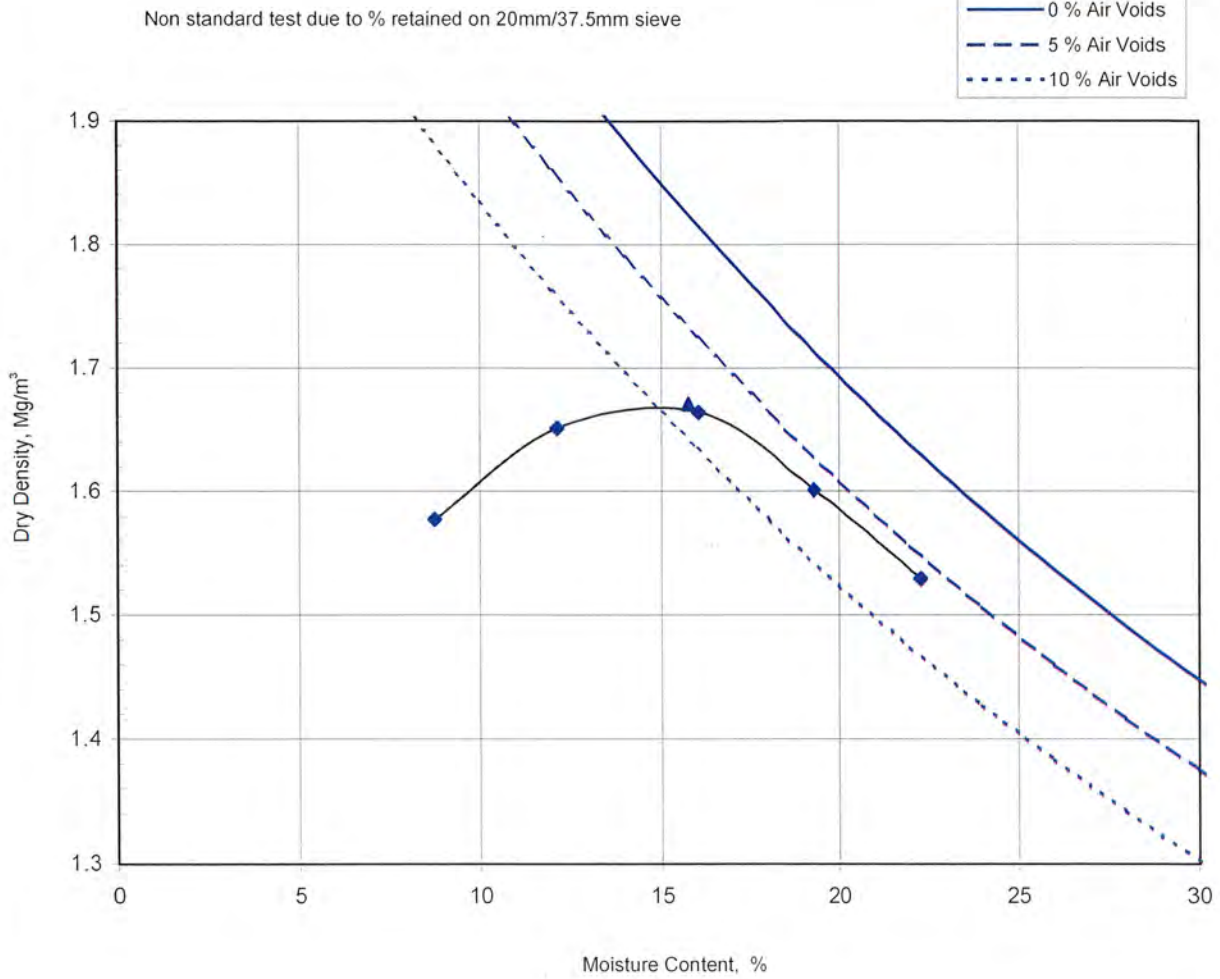
Originator  
SK  
Checked & Approved  
[Redacted]  
01/06/2021

**Moisture Content / Dry Density Relationship**  
BS1377:Part 4:1990 Clause 3.6




Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9
Client	Allied Exploration & Geotechnics Limited
Engineer	

Contract No	<b>A13955</b>
Hole	BH SBC027
Sample Ref	
Depth (m)	0.05
Sample Type	B2



Non Engineering Description	Brown clayey very garvelly very sandy SILT. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with some coarse gravel-size particles
Samples Used	Single
Mass Retained on 37.5 mm Sieve	% 15
Mass Retained on 20.0 mm Sieve	% 17
Particle Density - Measured	Mg/m <sup>3</sup> 2.56
Natural Moisture Content	% 24
Maximum Dry Density	Mg/m <sup>3</sup> 1.67
Optimum Moisture Content	% 15.8

Originator	Checked & Approved
SK	 01/06/2021

**Moisture Content / Dry Density Relationship**  
 BS1377:Part 4:1990 Clause 3.6





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - [REDACTED]  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- **TP SBC001**

Depth (m) :- **1.00**

Sample Type & No :- **B4**

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = **11**

Particle Density (Measured) = **2.65**

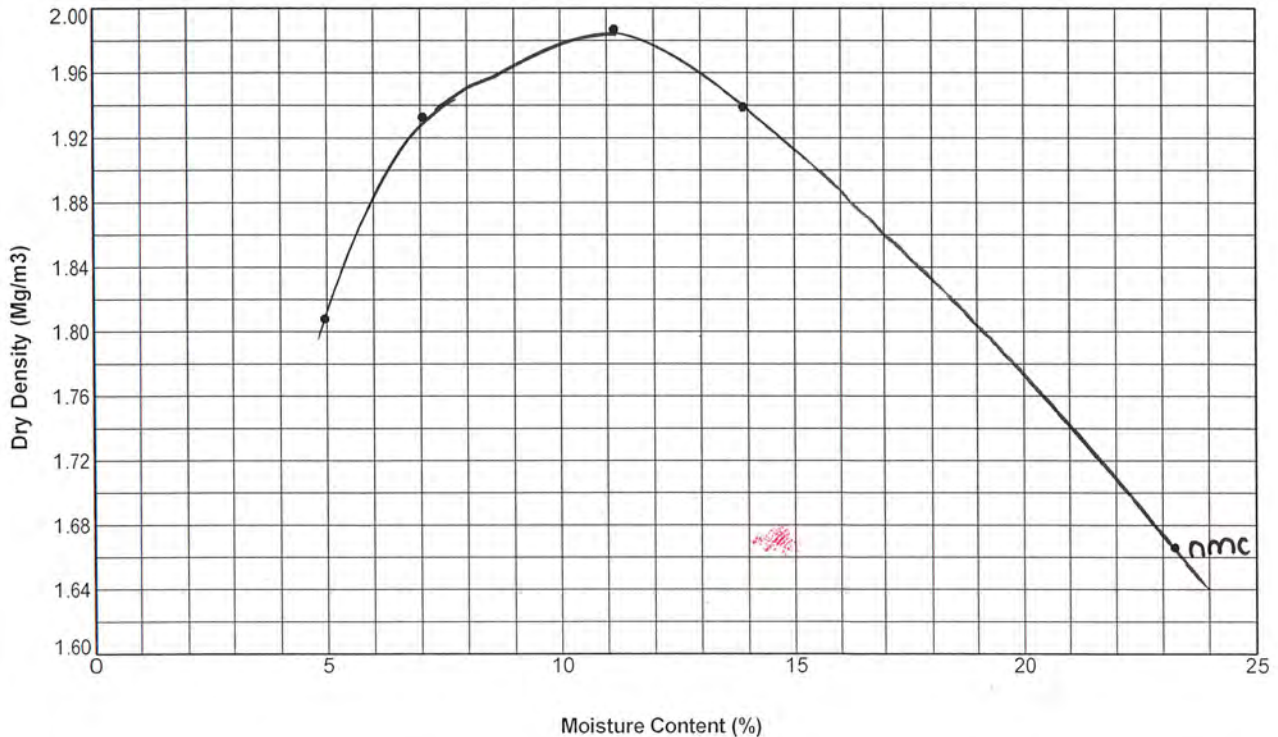
Maximum Dry Density (Mg/m<sup>3</sup>) = **1.99**

Retained on 20mm Sieve (%) = **23.0**

Date Tested = **04/05/2021**

Retained on 37.5mm Sieve (%) = **7.0**

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

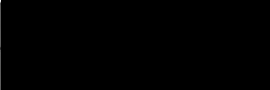
A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

26/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

**4322A**



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- **TP SBC011**

Depth (m) :- **2.00**

Sample Type & No :- **B9**

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = **11**

Particle Density (Measured) = **2.58**

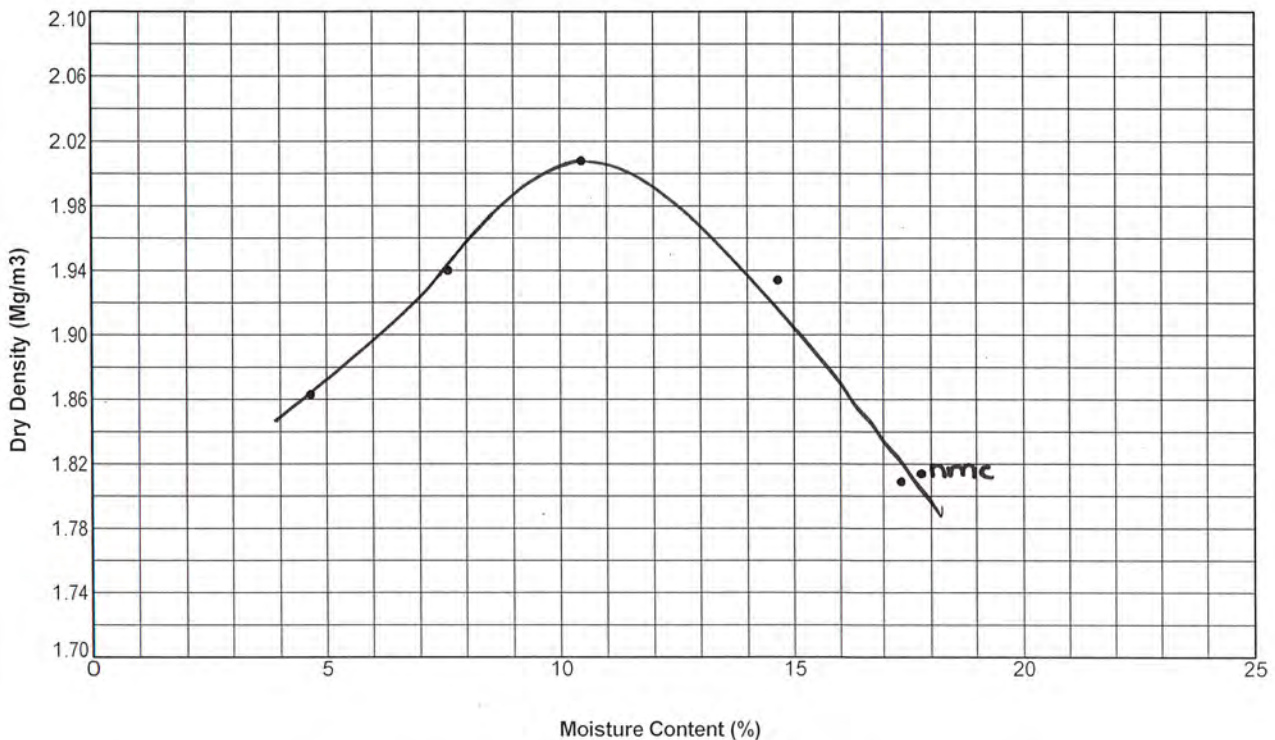
Maximum Dry Density (Mg/m<sup>3</sup>) = **2.01**

Retained on 20mm Sieve (%) = **9.8**

Date Tested = **28/04/2021**

Retained on 37.5mm Sieve (%) = **3.7**

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <b>A66 North Trans Pennine Scheme C Section 9</b>	Client :- <b>AMEY OW Limited</b>
--	-------------------------------------

	Signed :- [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 1 of 1	
	Date of issue :- <b>26/05/2021</b>	Certificate No :- <b>COMP/4322A/1</b>	AEG Contract No. :- <b>4322A</b>	1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01524 534400

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC012A

Depth (m) :- 4.00

Sample Type & No :- B13

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 10

Particle Density (Assumed) = 2.70

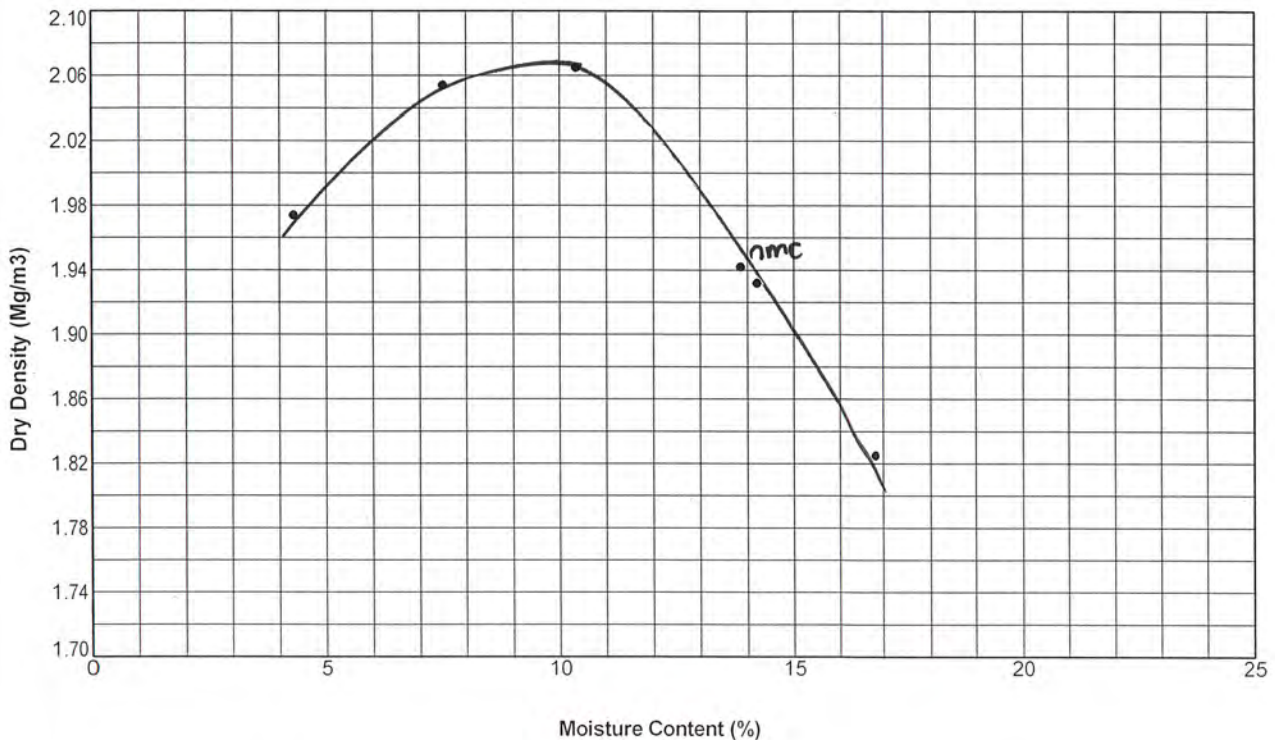
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.07

Retained on 20mm Sieve (%) = 3.7

Date Tested = 27/04/2021

Retained on 37.5mm Sieve (%) = 0.6

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :



Name :-

M. SELKIRK

Page 1 of 1

Date of issue

26/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC013

Depth (m) :- 4.00

Sample Type & No :- B12

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 9.0

Particle Density (Measured) = 2.64

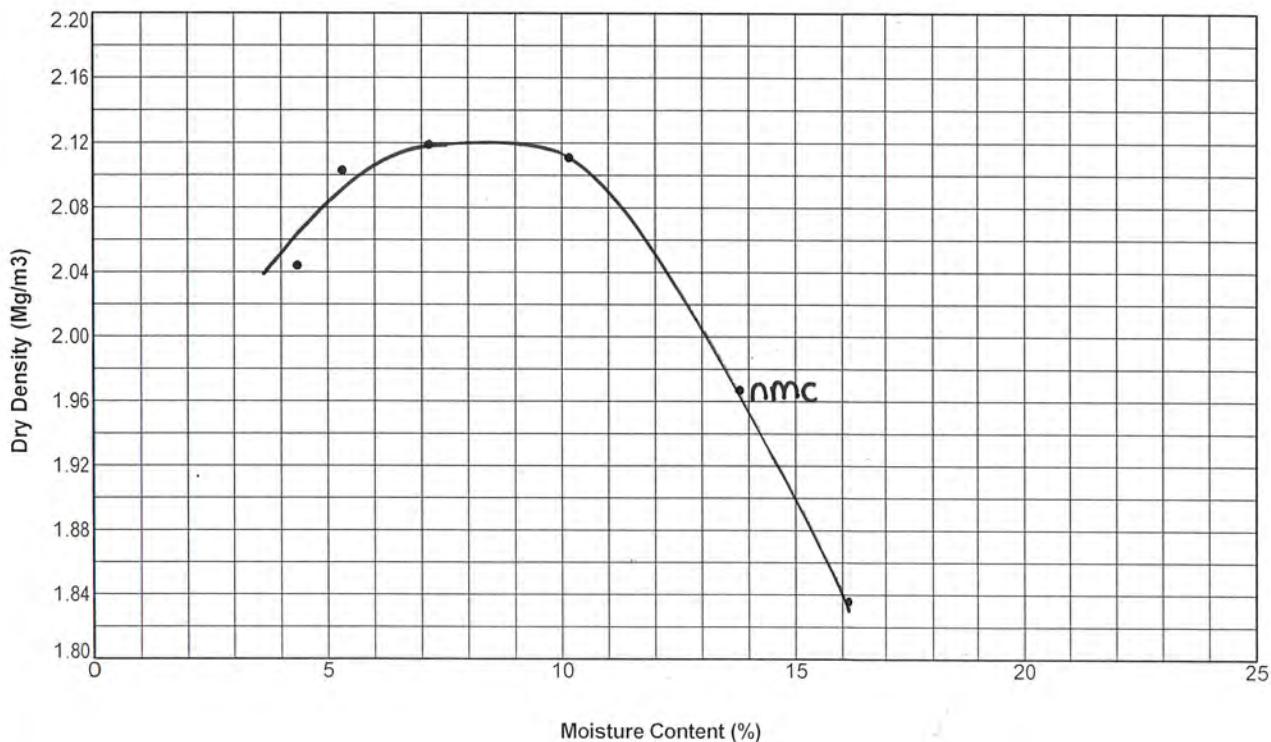
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.12

Retained on 20mm Sieve (%) = 7.5

Date Tested = 06/05/2021

Retained on 37.5mm Sieve (%) = 3.9

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed: [REDACTED]

Date of issue:

26/05/2021

Name :-

M. SELKIRK

Certificate No :-

COMP/4322A/1

Page 1 of 1

AEG Contract No. :-

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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01524 881111

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990 (Test deviated from standard due to excessive coarse material)

### Specimen Identification

Exploratory Hole No :- TP SBC014

Depth (m) :- 1.60

Sample Type & No :- B9

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 9.0

Particle Density (Measured) = 2.64

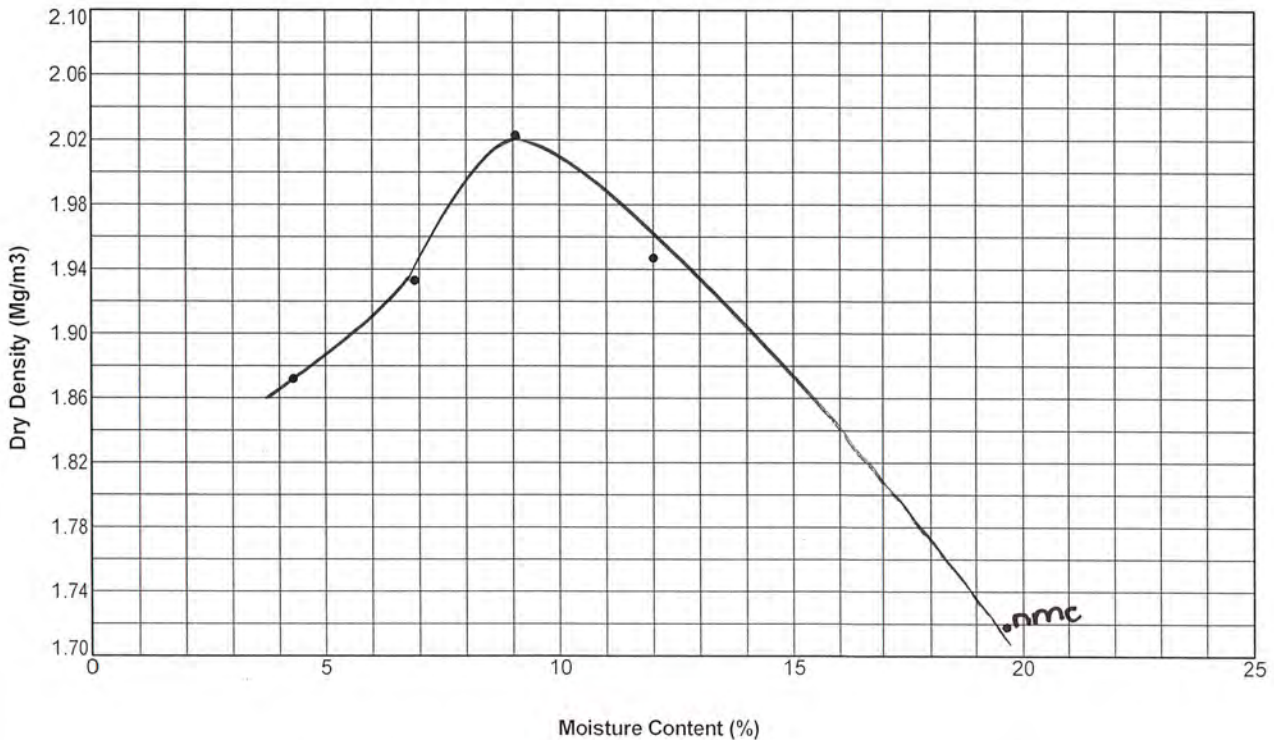
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.02

Retained on 20mm Sieve (%) = 35.0

Date Tested = 28/04/2021

Retained on 37.5mm Sieve (%) = 23.0

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-

[Redacted Signature]

Name :-

**M. SELKIRK**

Page 1 of 1

Date of issue :-

26/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RQ  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

**Specimen Identification**

Exploratory Hole No :- **TP SBC014**

Depth (m) :- **2.80**

Sample Type & No :- **B14**

**Test Method**

4.5kg Compaction

Single Sample

**Test Results**

Optimum Moisture Content (%) = **11**

Particle Density (Measured) = **2.64**

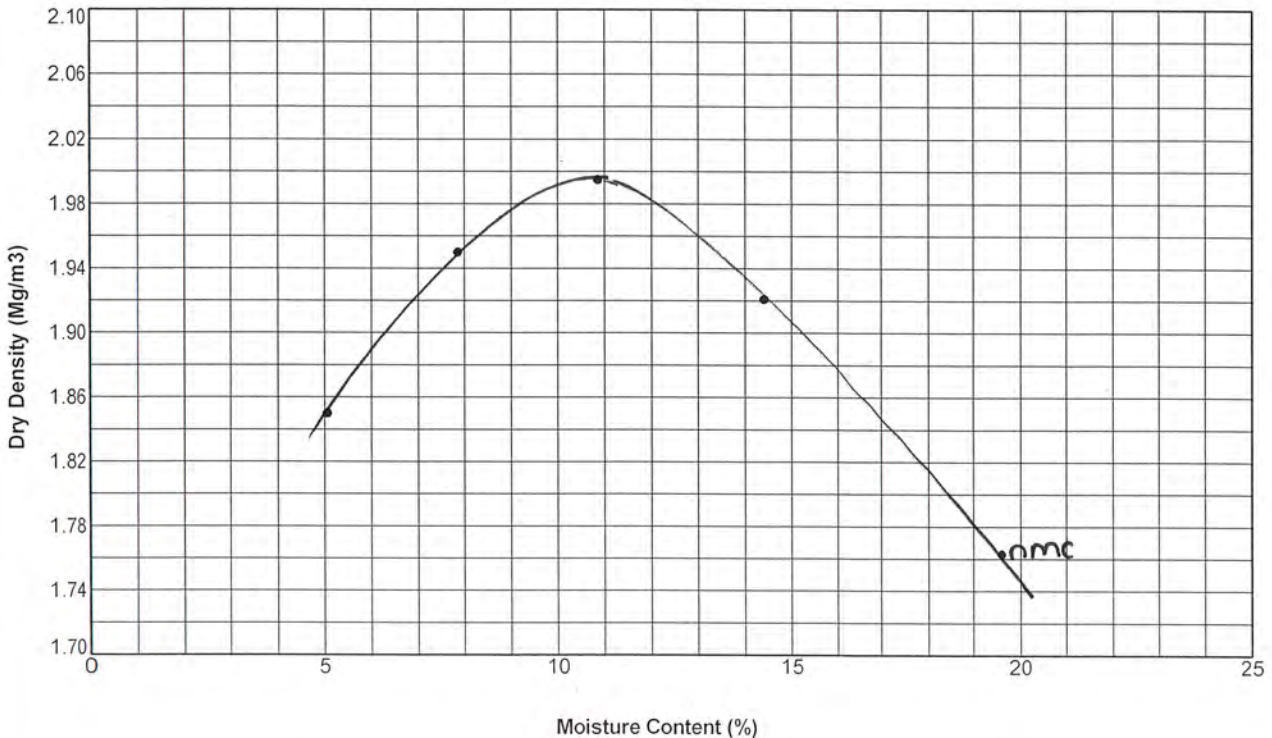
Maximum Dry Density (Mg/m<sup>3</sup>) = **2.00**

Retained on 20mm Sieve (%) = **7.8**

Date Tested = **23/04/2021**

Retained on 37.5mm Sieve (%) = **3.6**

**Remarks :**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed:



Name :-

**M. SELKIRK**

Page 1 of 1

Date of issue :-

17/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

**4322A**





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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RQ  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC017

Depth (m) :- 2.00

Sample Type & No :- B10

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 9.0

Particle Density (Measured) = 2.64

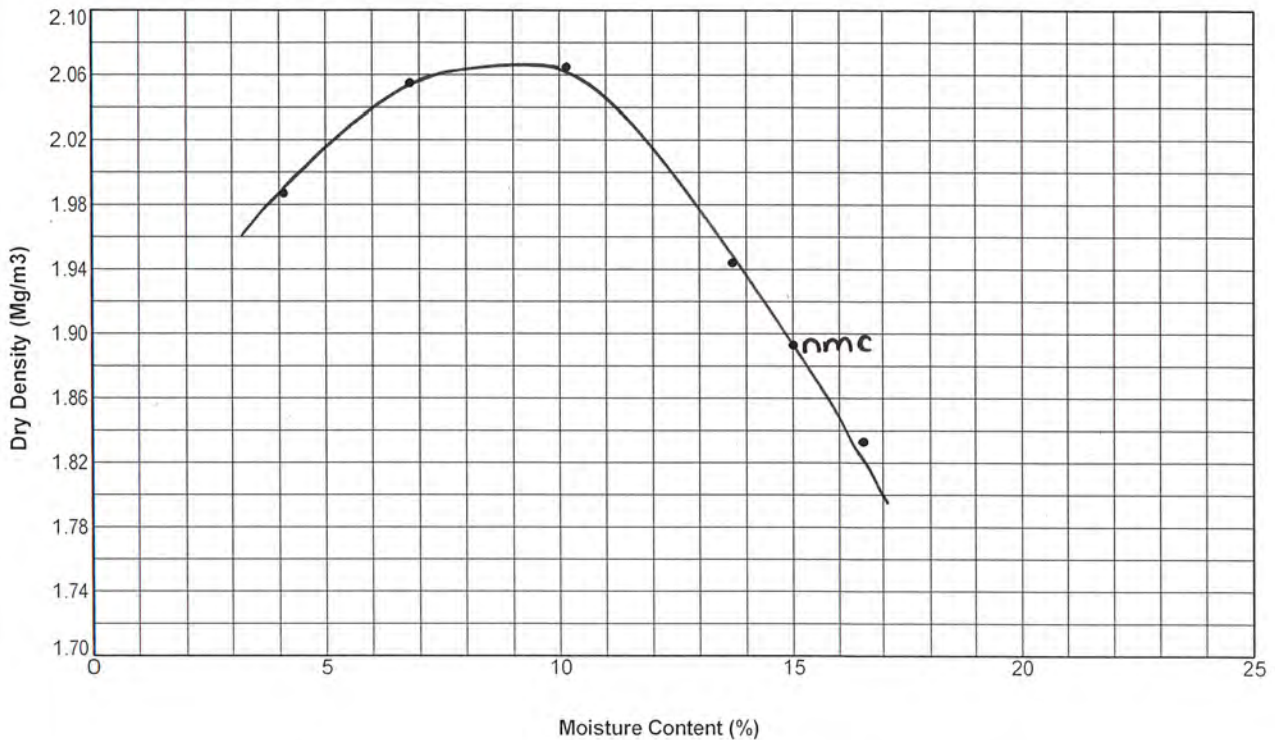
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.07

Retained on 20mm Sieve (%) = 7.9

Date Tested = 22/04/2021

Retained on 37.5mm Sieve (%) = 4.1

Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-

[REDACTED SIGNATURE]

Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

17/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL, T

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC018

Depth (m) :- 2.00

Sample Type & No :- B9

### Test Method

4.5kg Compaction

Separate Samples

### Test Results

Optimum Moisture Content (%) = 11

Particle Density (Measured) = 2.63

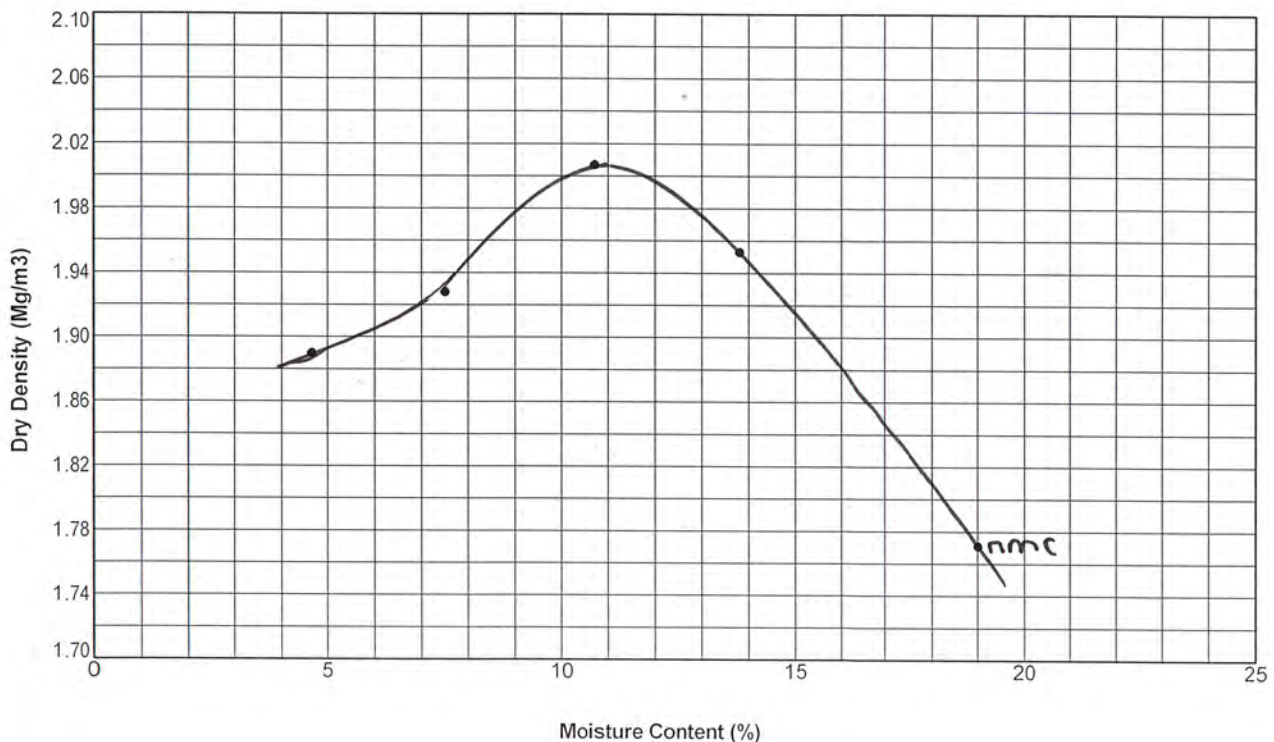
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.00

Retained on 20mm Sieve (%) = 6.2

Date Tested = 30/04/2021

Retained on 37.5mm Sieve (%) = 1.7

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-

[Redacted Signature]

Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

24/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC021

Depth (m) :- 1.00

Sample Type & No :- B6

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 14

Particle Density (Measured) = 2.64

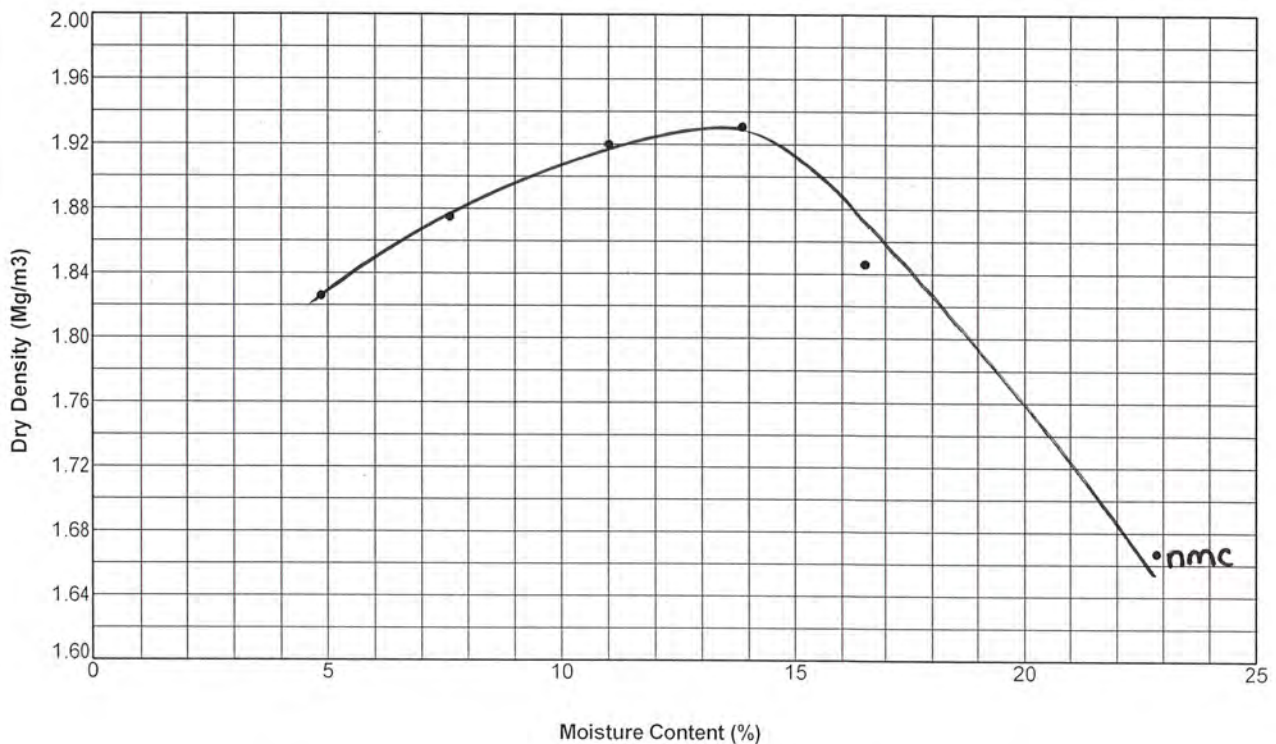
Maximum Dry Density (Mg/m<sup>3</sup>) = 1.93

Retained on 20mm Sieve (%) = 7.4

Date Tested = 05/05/2021

Retained on 37.5mm Sieve (%) = 3.7

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

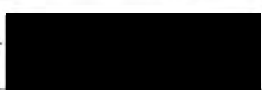
A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :

M. SELKIRK

Page 1 of 1

Date of issue :-

24/05/2021

Certificate No :-

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AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- **TP SBC022**

Depth (m) :- **3.00**

Sample Type & No :- **B10**

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = **7.5**

Particle Density (Measured) = **2.66**

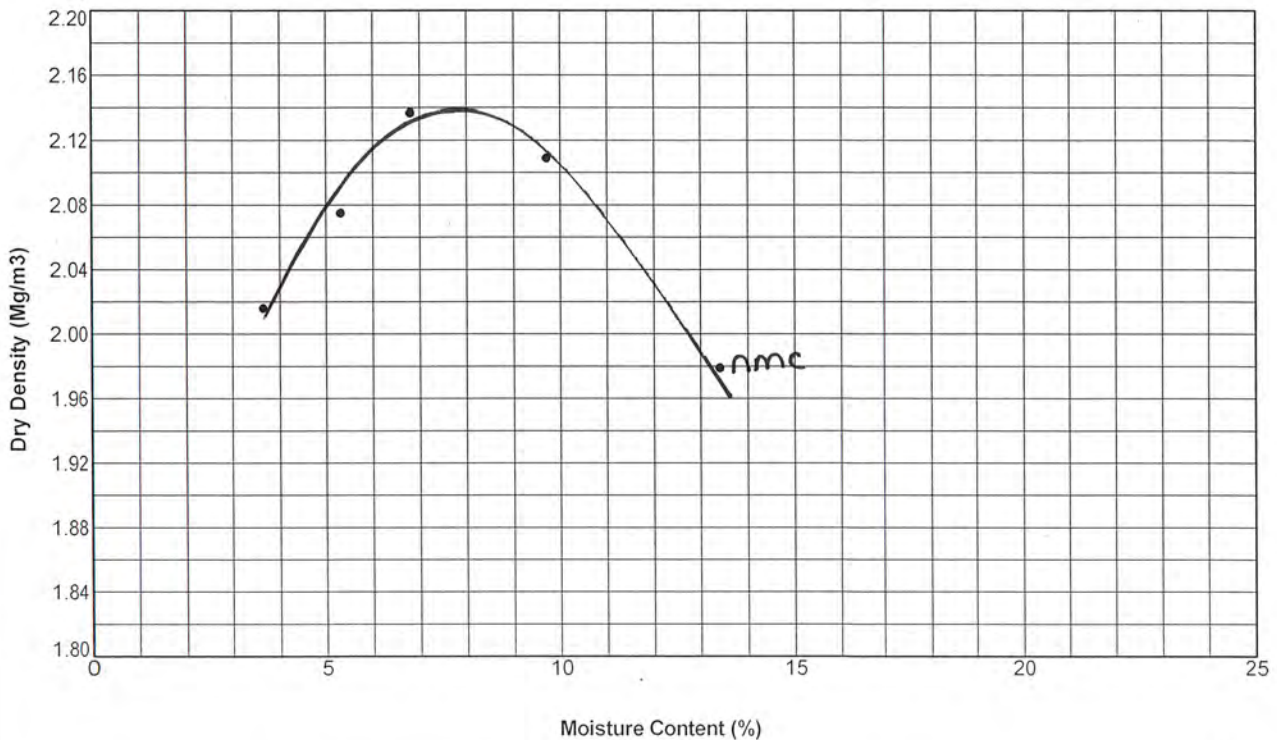
Maximum Dry Density (Mg/m<sup>3</sup>) = **2.14**

Retained on 20mm Sieve (%) = **11.1**

Date Tested = **06/05/2021**

Retained on 37.5mm Sieve (%) = **2.0**

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

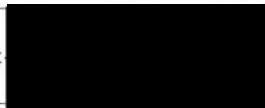
A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

24/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A





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Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC026

Depth (m) :- 1.00

Sample Type & No :- B5

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 11

Particle Density (Measured) = 2.65

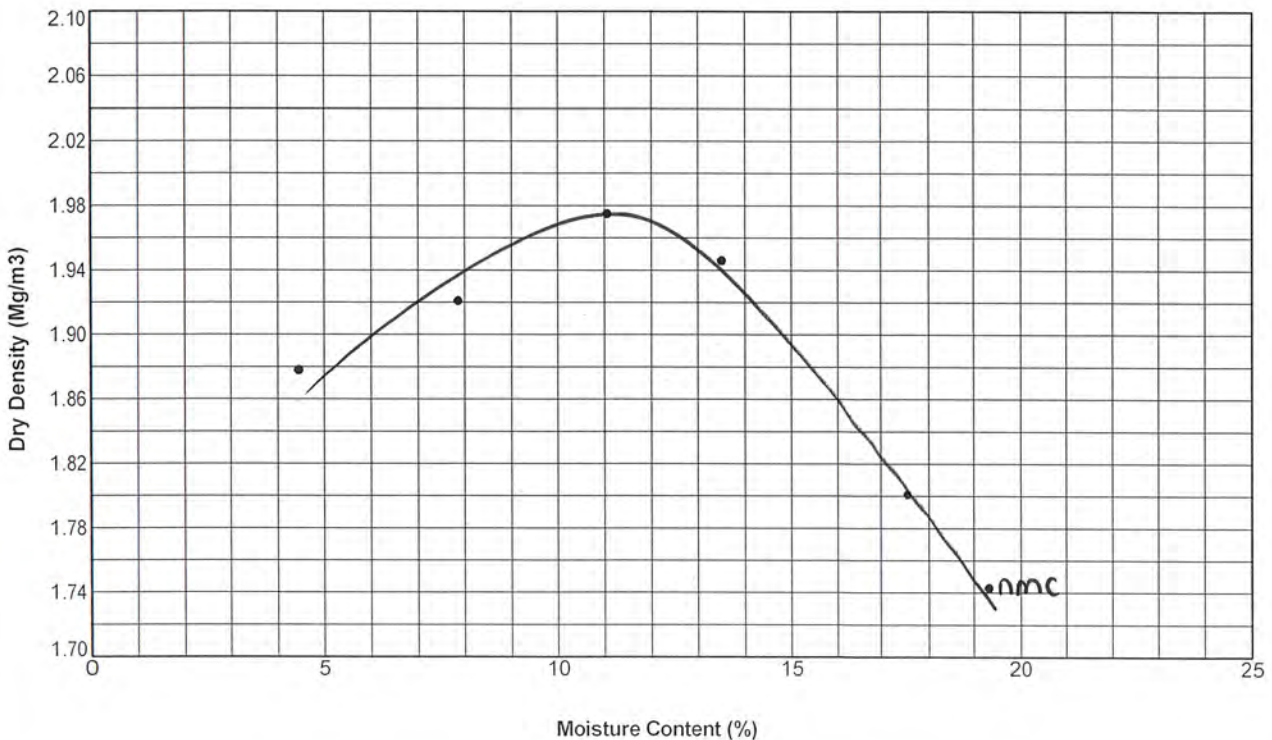
Maximum Dry Density (Mg/m<sup>3</sup>) = 1.98

Retained on 20mm Sieve (%) = 8.0

Date Tested = 22/04/2021

Retained on 37.5mm Sieve (%) = 5.0

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :

[REDACTED]

Name :-

**M. SELKIRK**

Page 1 of 1

Date of

17/05/2021

Certificate No :-

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AEG Contract No. :-

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# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- **TP SBC027**

Depth (m) :- **3.00**

Sample Type & No :- **B11**

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = **9.0**

Particle Density (Measured) = **2.67**

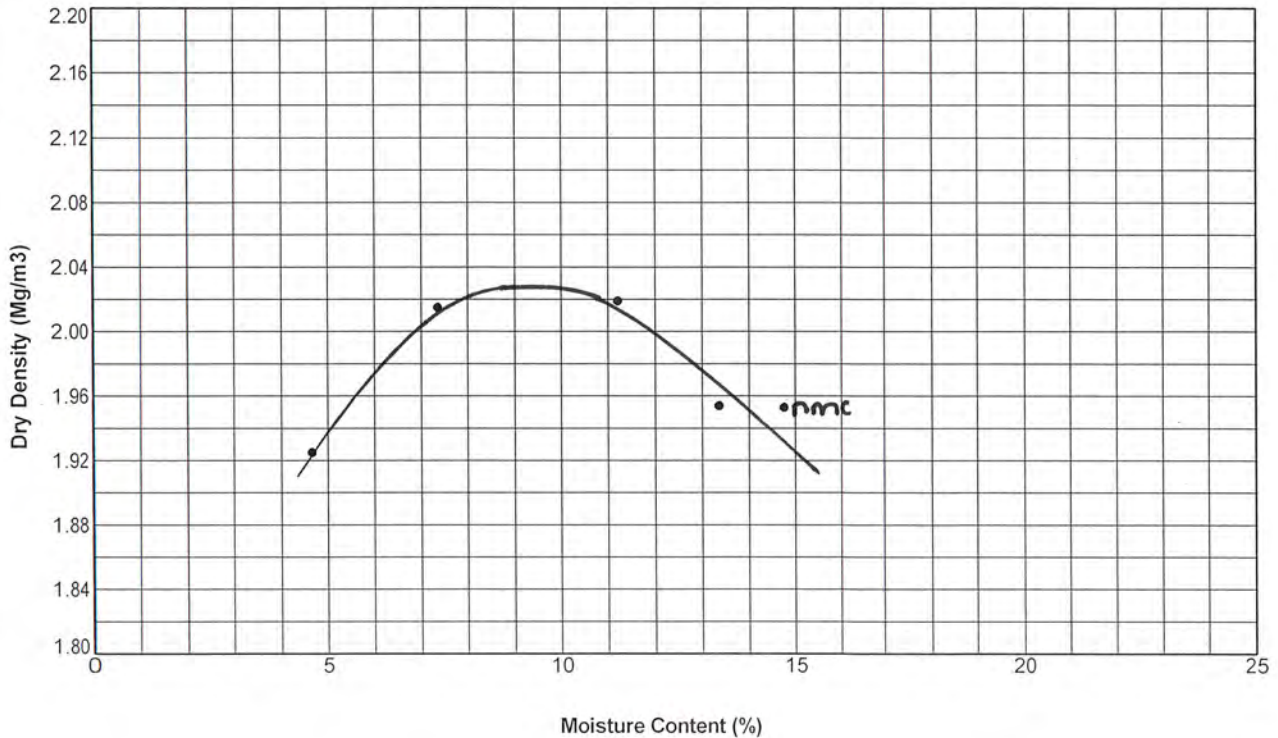
Maximum Dry Density (Mg/m<sup>3</sup>) = **2.02**

Retained on 20mm Sieve (%) = **7.0**

Date Tested = **06/05/2021**

Retained on 37.5mm Sieve (%) = **0.0**

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

26/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No :-

**4322A**





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC028

Depth (m) :- 4.80

Sample Type & No :- B19

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 7.5

Particle Density (Measured) = 2.65

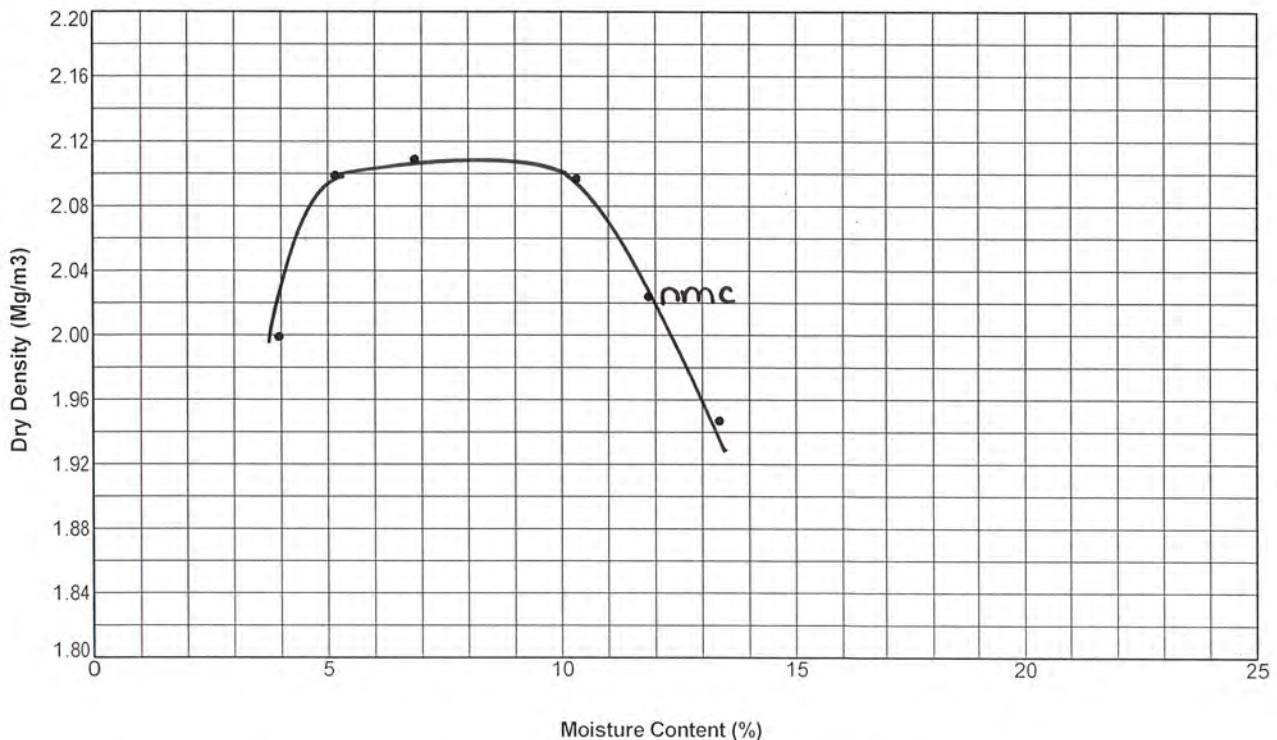
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.11

Retained on 20mm Sieve (%) = 7.3

Date Tested = 22/04/2021

Retained on 37.5mm Sieve (%) = 1.5

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-

[REDACTED]

Name :-

**M. SELKIRK**

Page 1 of 1

Date of issue :-

24/05/2021

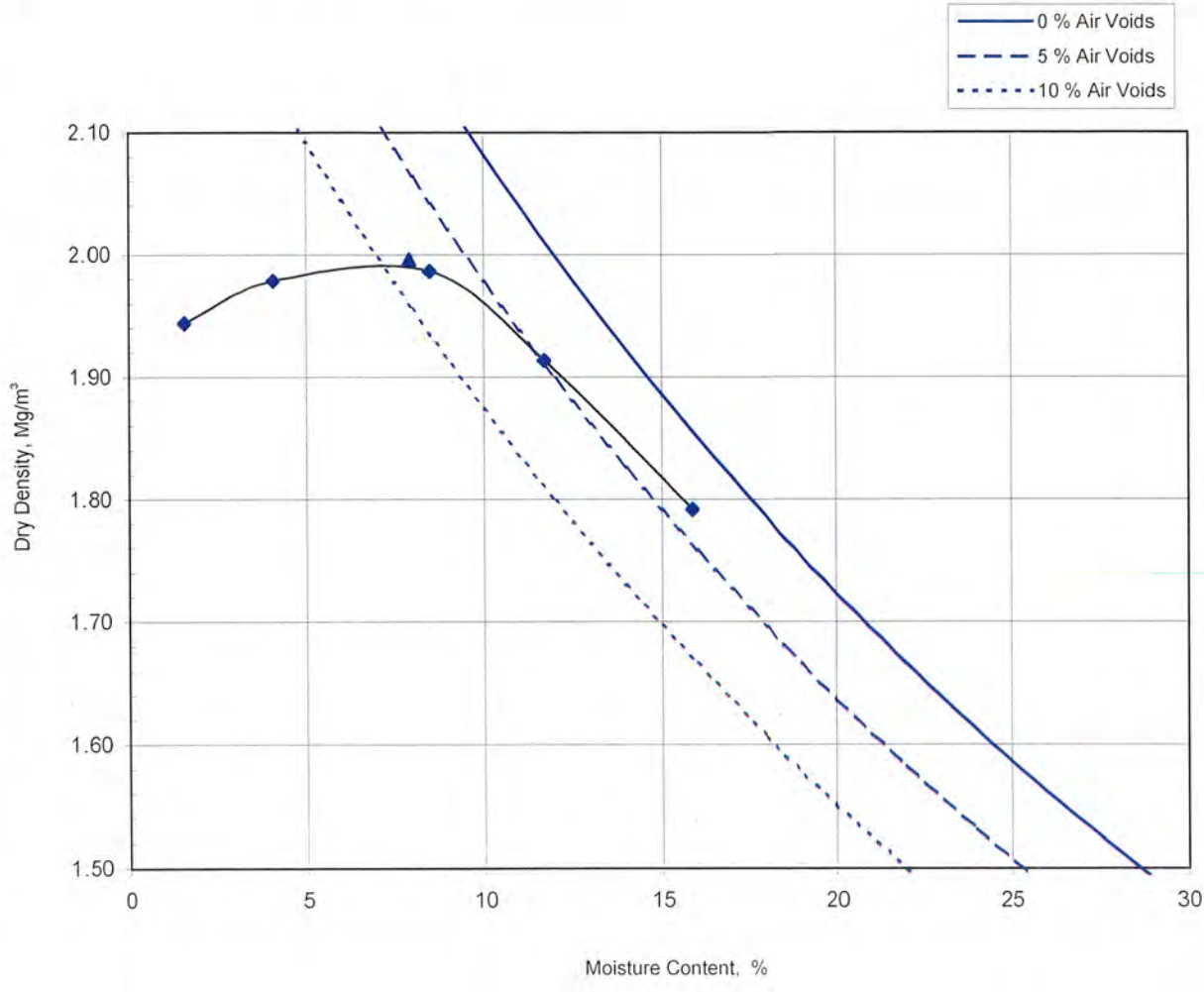
Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A





Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse
Preparation	Oven dried
Test Method	4.5kg Rammer for soils with particles up to medium-gravel size
Samples Used	Single
Mass Retained on 37.5 mm Sieve	0 %
Mass Retained on 20.0 mm Sieve	1 %
Particle Density - Measured	2.63 Mg/m³
Natural Moisture Content	12 %
Maximum Dry Density	2.00 Mg/m³
Optimum Moisture Content	7.9 %

Originator	Checked & Approved
SK	[Redacted Signature]
	01/06/2021





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01524 535353

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC031

Depth (m) :- 0.80

Sample Type & No :- B6

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 14

Particle Density (Measured) = 2.63

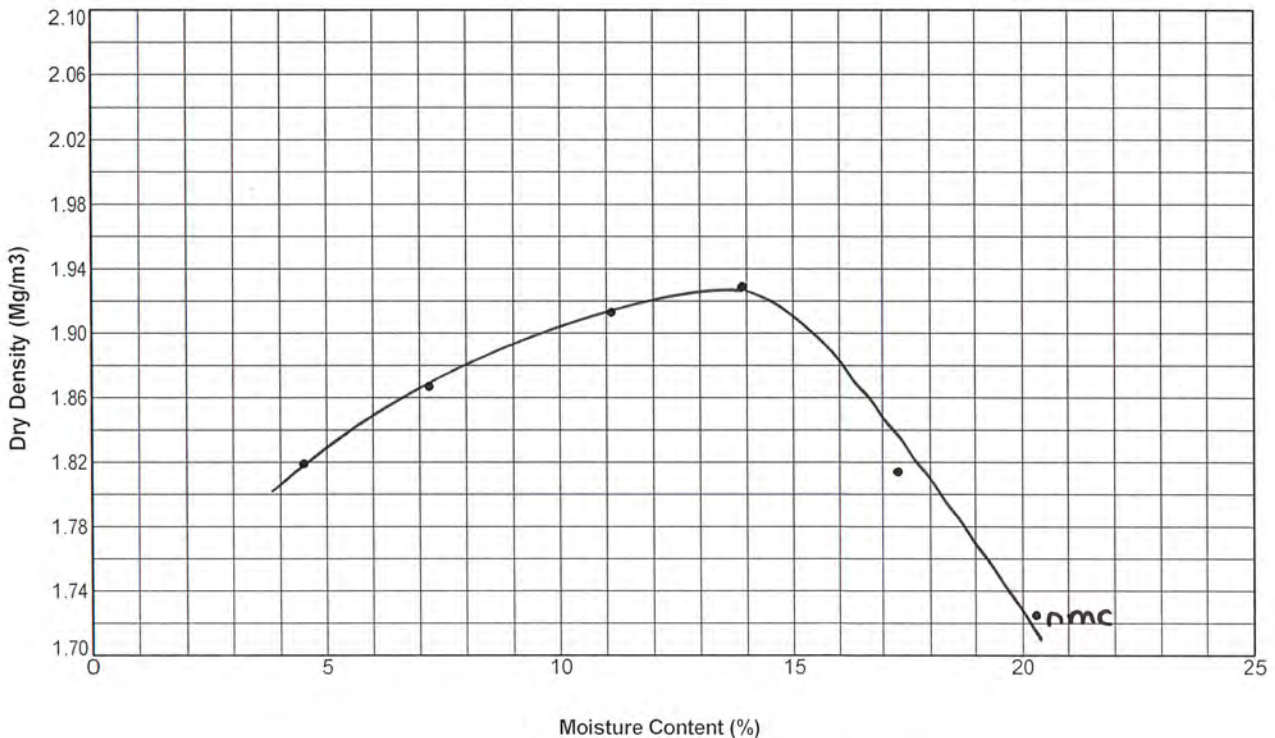
Maximum Dry Density (Mg/m<sup>3</sup>) = 1.93

Retained on 20mm Sieve (%) = 10.0

Date Tested = 14/04/2021

Retained on 37.5mm Sieve (%) = 0.0

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

17/05/2021

Certificate No :-

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4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

### Specimen Identification

Exploratory Hole No :- TP SBC032

Depth (m) :- 1.00

Sample Type & No :- B7

### Test Method

4.5kg Compaction

Single Sample

### Test Results

Optimum Moisture Content (%) = 11

Particle Density (Measured) = 2.65

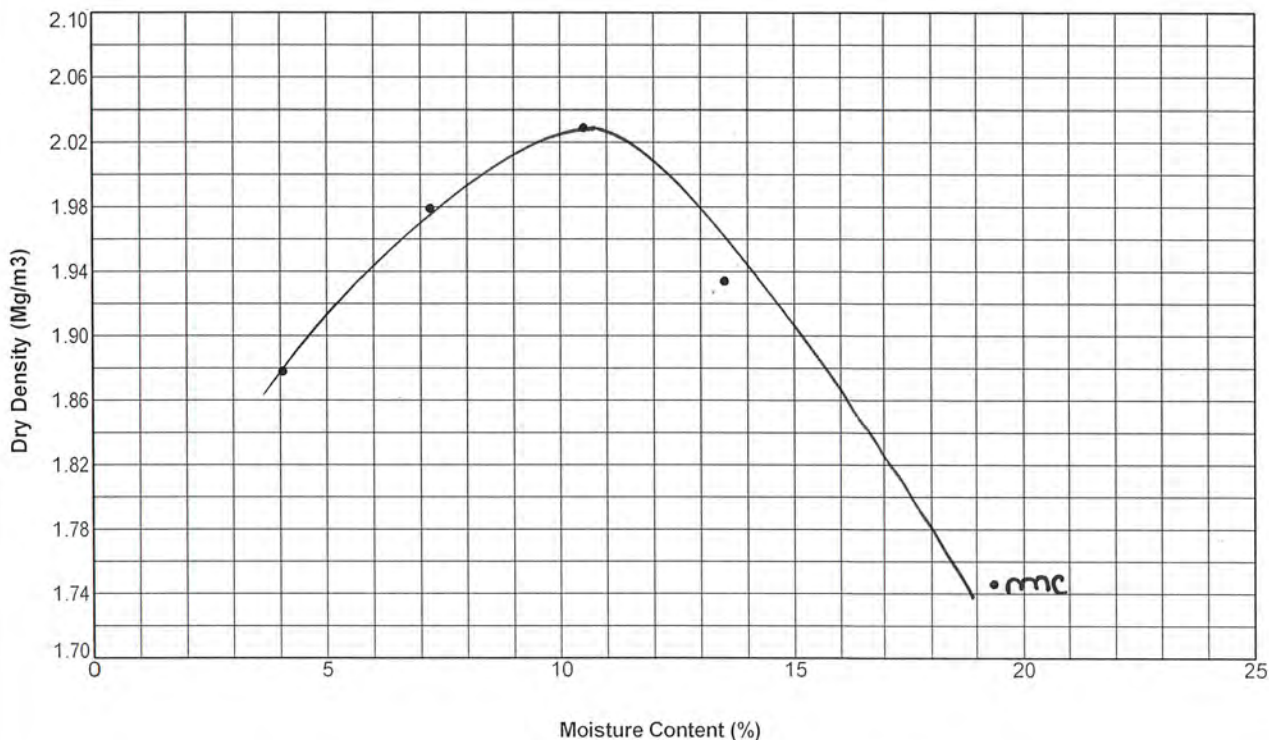
Maximum Dry Density (Mg/m<sup>3</sup>) = 2.03

Retained on 20mm Sieve (%) = 5.6

Date Tested = 19/04/2021

Retained on 37.5mm Sieve (%) = 2.1

### Remarks :



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed

[Redacted Signature]

Name :-

M. SELKIRK

Page 1 of 1

Date of Issue

17/05/2021

Certificate No :-

COMP/4322A/1

AEG Contract No. :-

4322A





## Determination of Moisture Condition Value



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

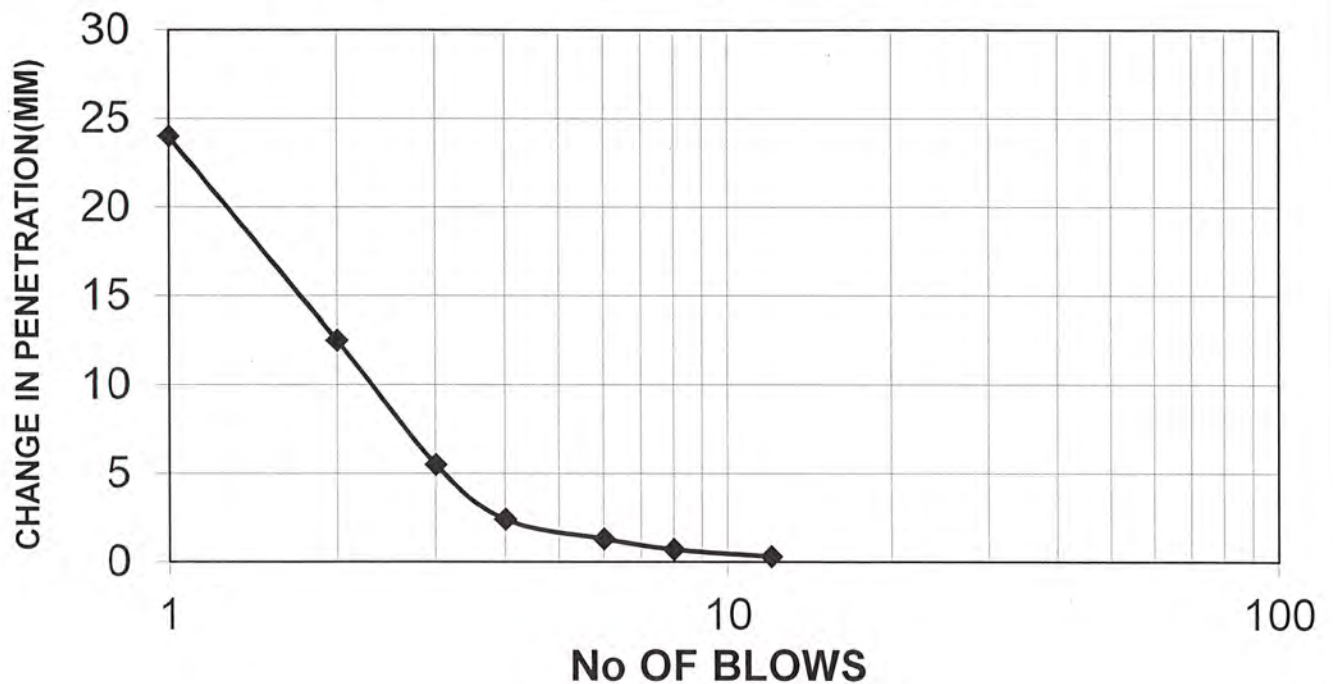


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	1.20m
<b>Sample No:</b>	BH SBC007 B8	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



Sample	NAT
MCV	5.0
M.C.(%)	31.9
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0.6% Retained on 20mm sieve

DATE TESTED: 10/ [REDACTED]

DATE OF ISSUE: 28/05/2021

APPROVED BY: [REDACTED]

NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



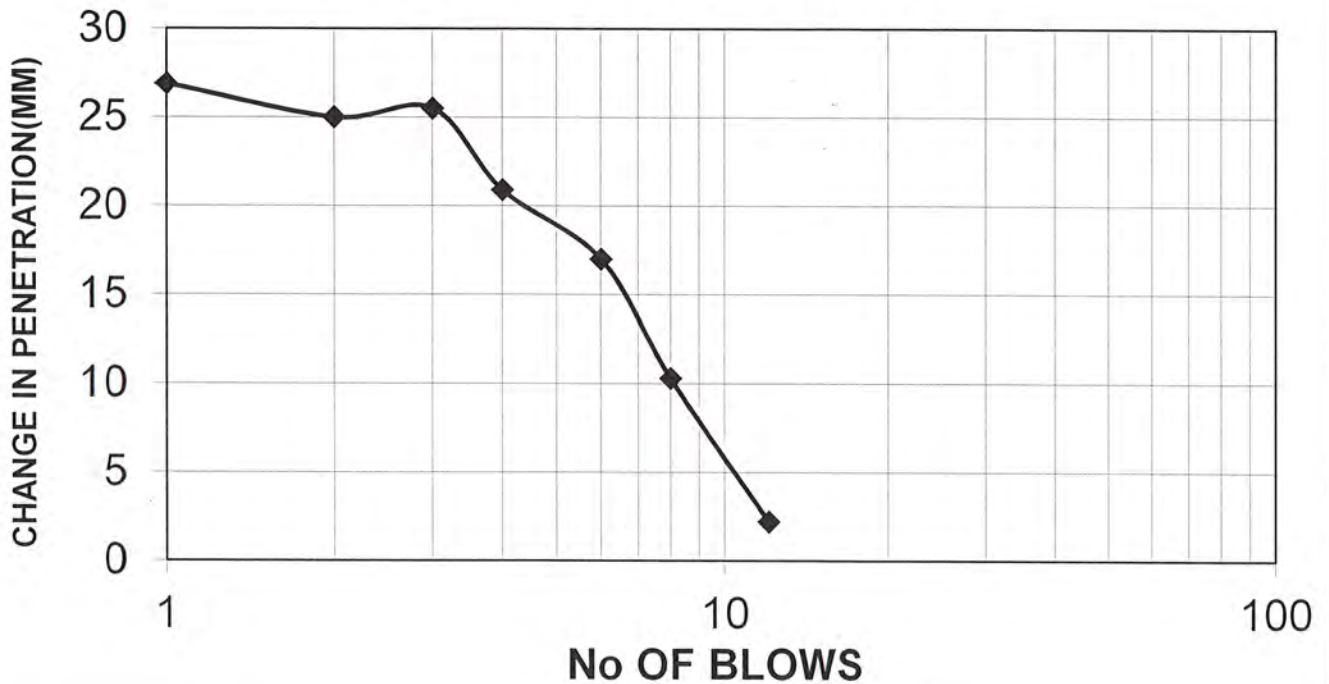
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.30m  
**Sample No:** BH SBC011 B17      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



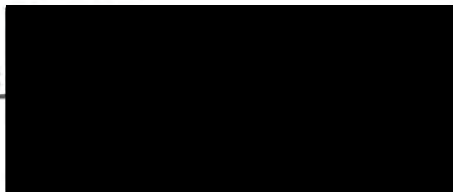
Sample	NAT
MCV	10.2
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 4.9% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

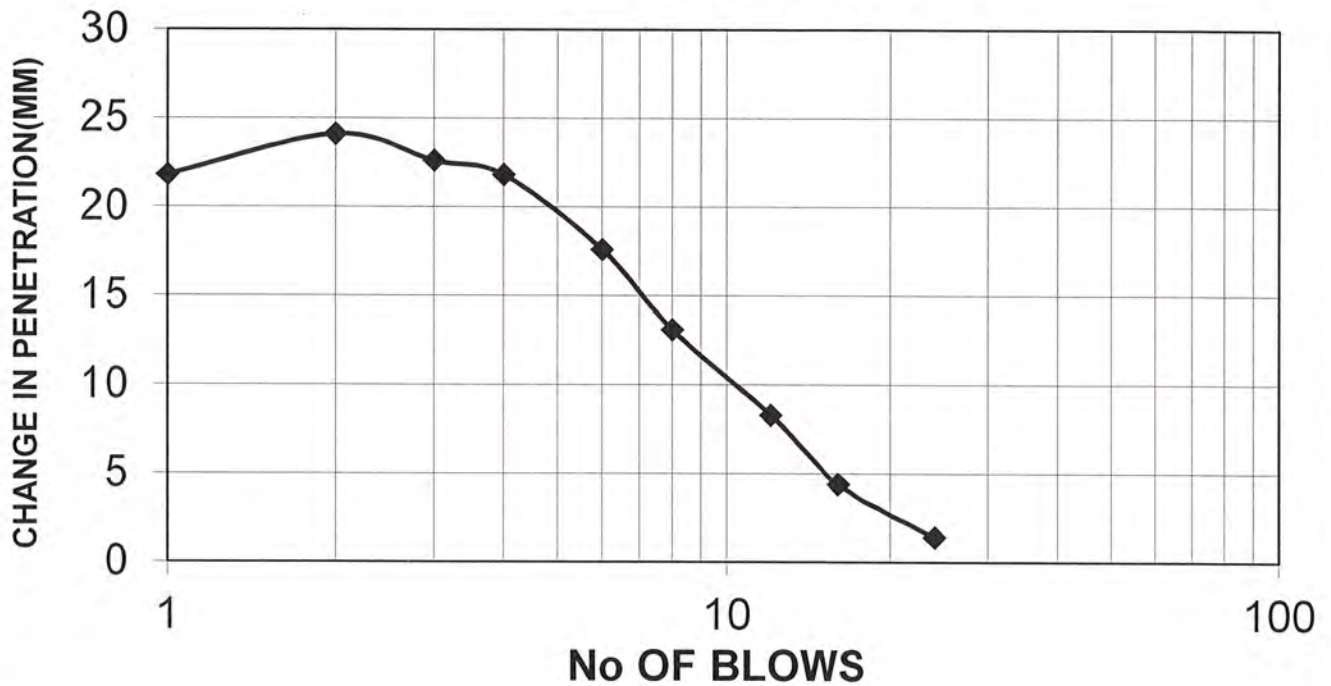


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.30m  
**Sample No:** BH SBC012 B15      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



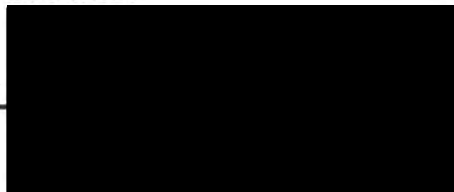
Sample	NAT
MCV	11.8
M.C.(%)	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



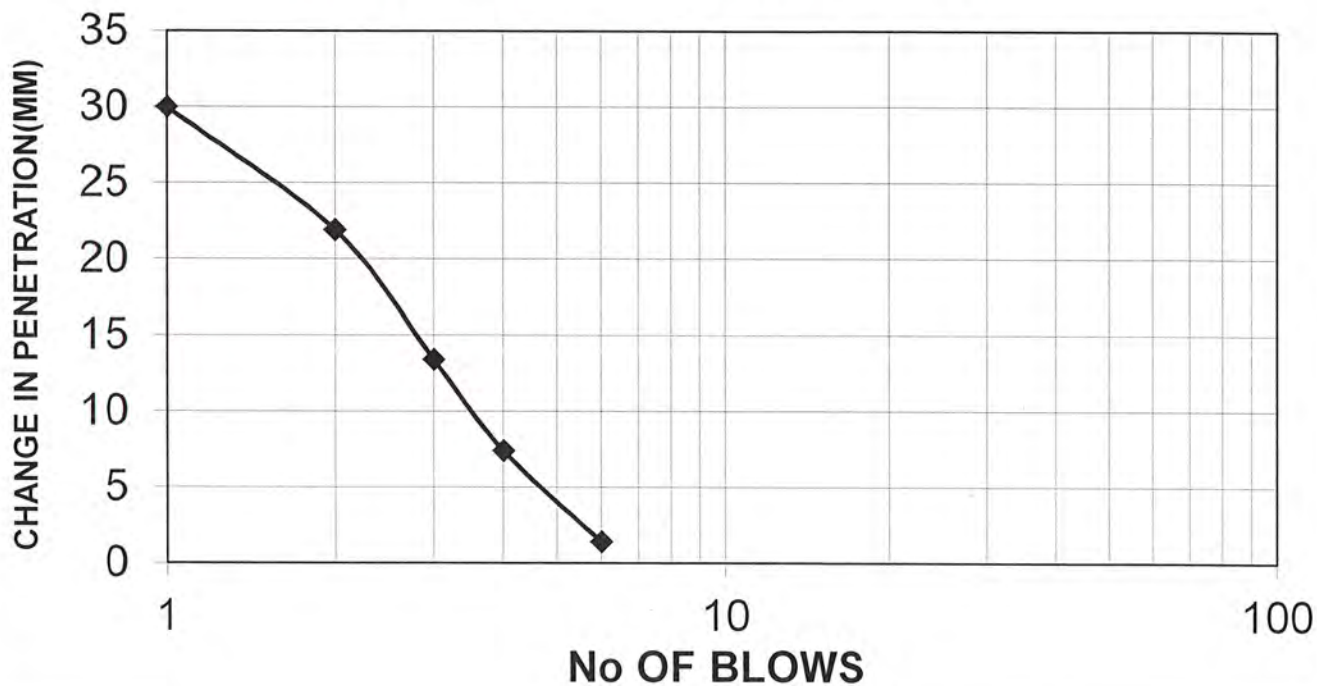
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	2.20m
<b>Sample No:</b>	BH SBC013 B7	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



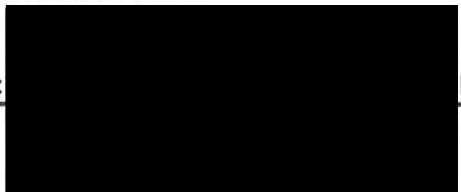
Sample	NAT
MCV	6.7
M.C.(%)	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 8.1% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 03/06/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

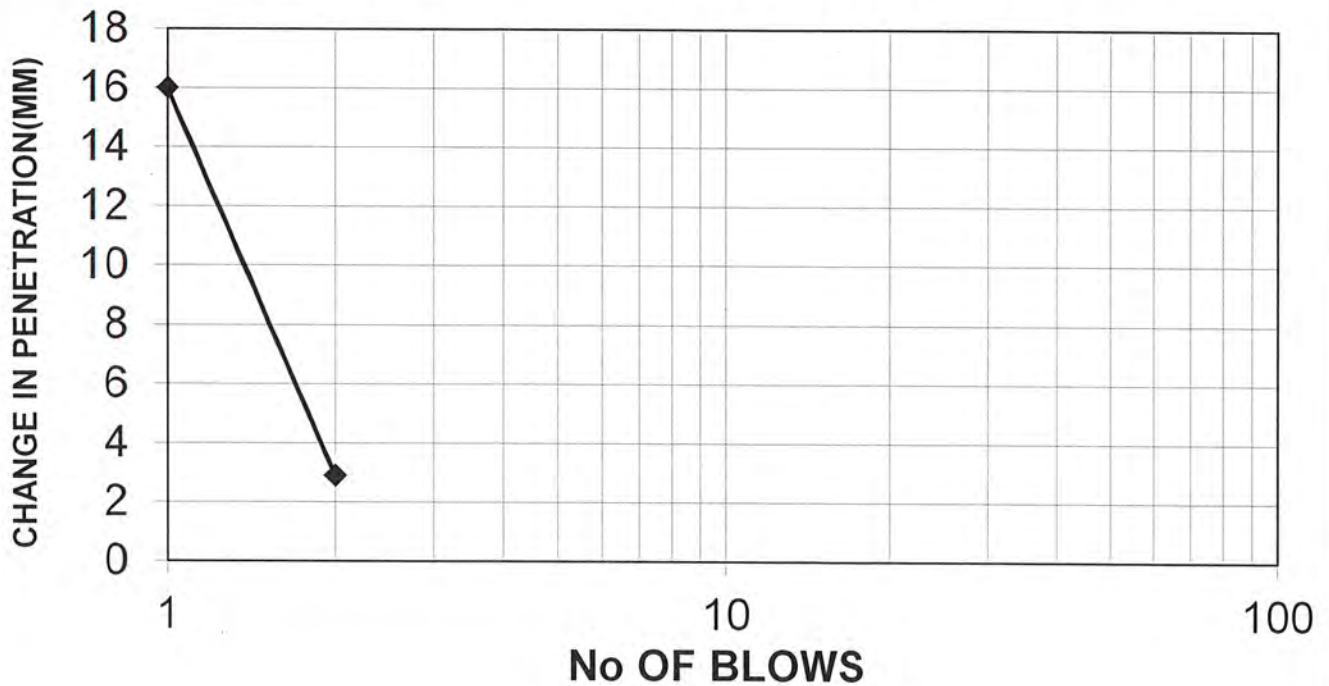


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	4.20m
<b>Sample No:</b>	BH SBC013 B14	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



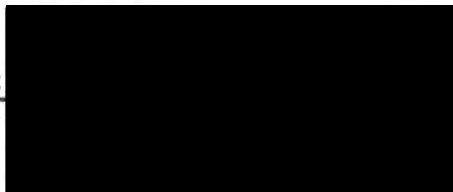
Sample	NAT
MCV	2.5
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 1.3% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 03/06/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

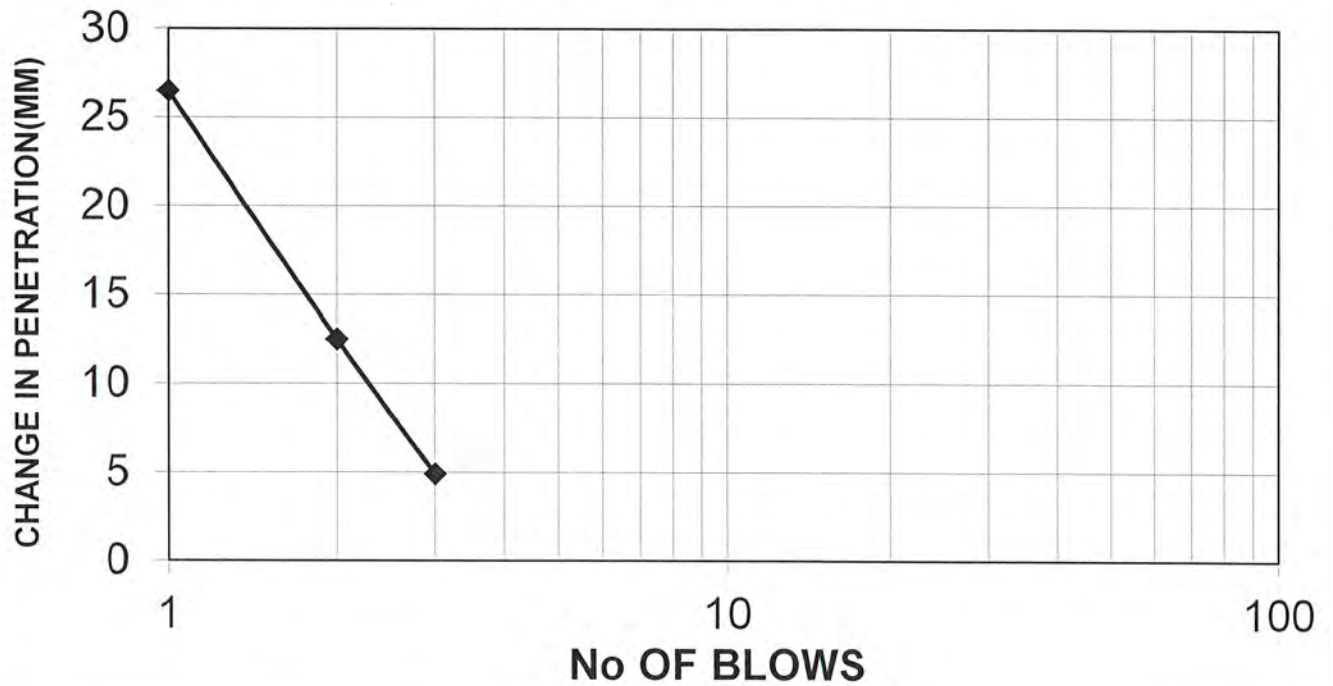


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 9.70m  
**Sample No:** BH SBC013 B30      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



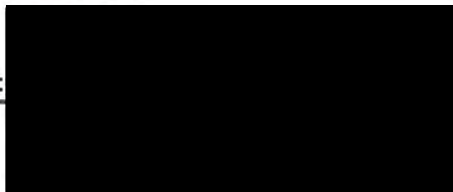
Sample	NAT
MCV	4.8
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 2.0% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk



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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

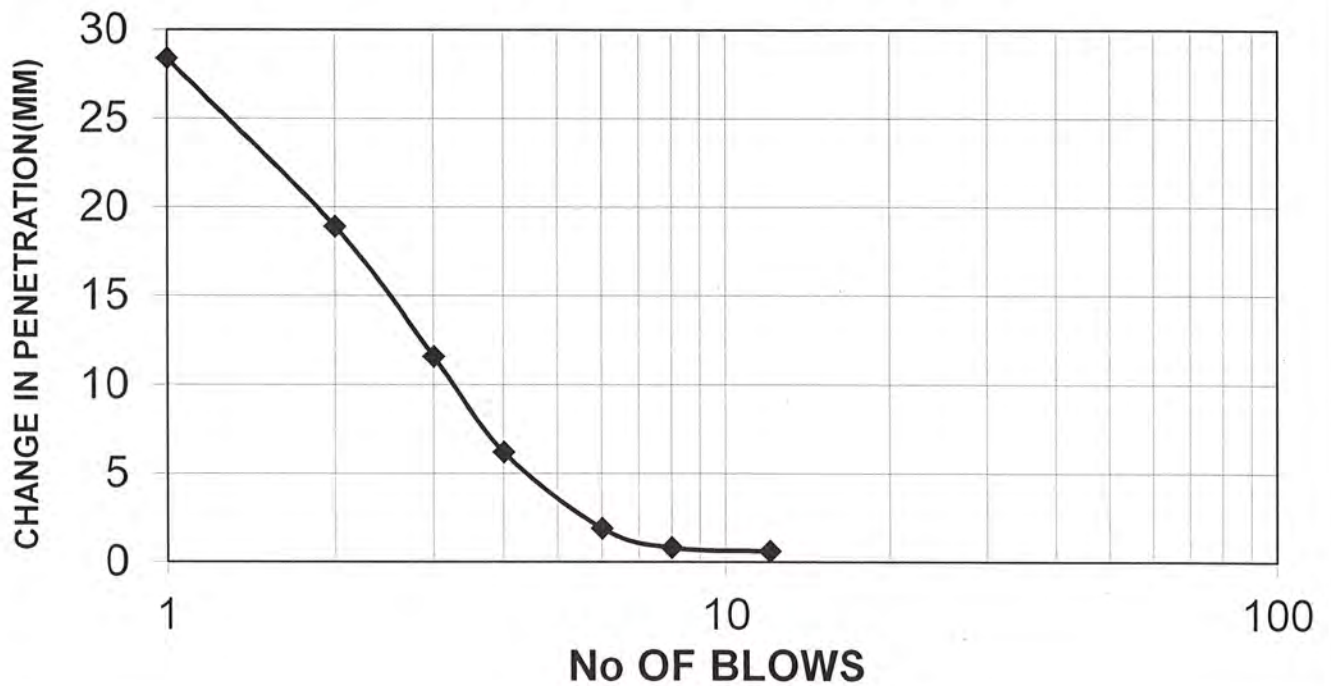


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	4.50m
<b>Sample No:</b>	BH SBC014A B15	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



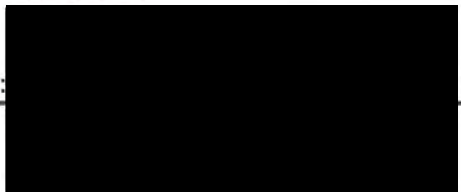
Sample	NAT
MCV	6.5
M.C.(%)	62
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 15.6% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

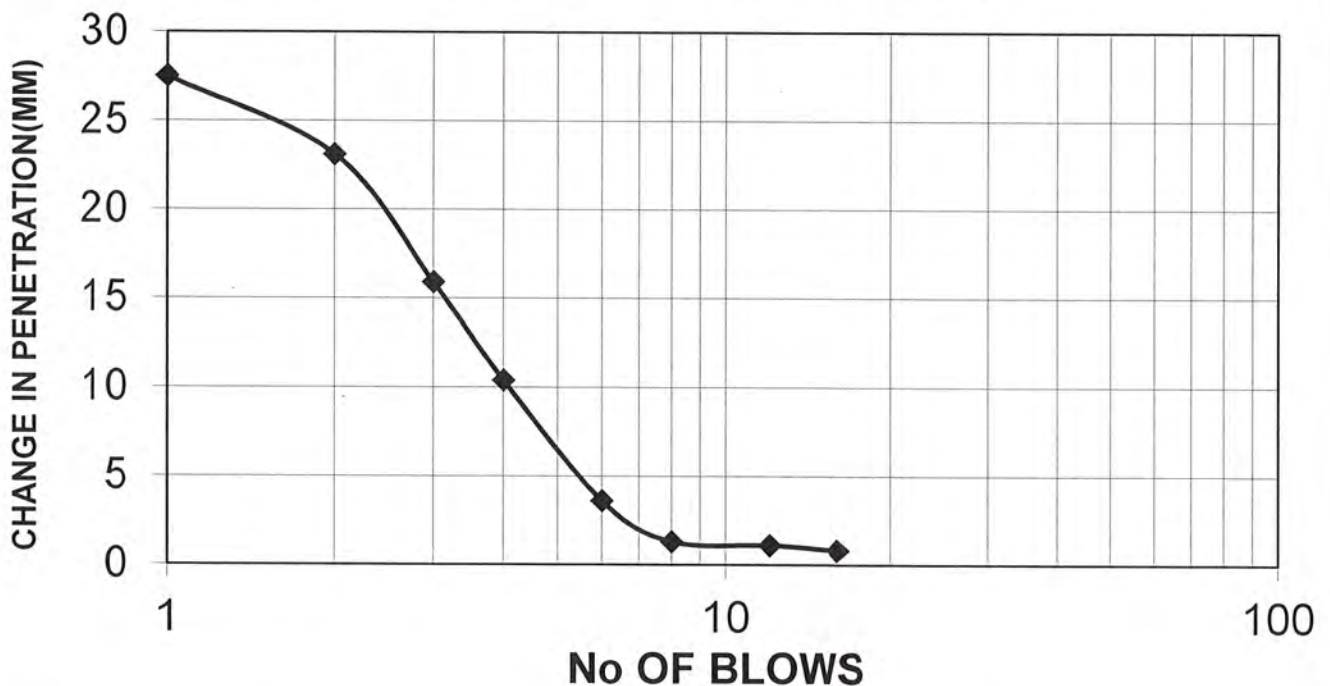


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	4.20m
<b>Sample No:</b>	BH SBC015 B12	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

### CHANGE IN PENETRATION PLOT



Sample	NAT
MCV	7.4
M.C.(%)	15
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:

NAME: Michelle Selkirk



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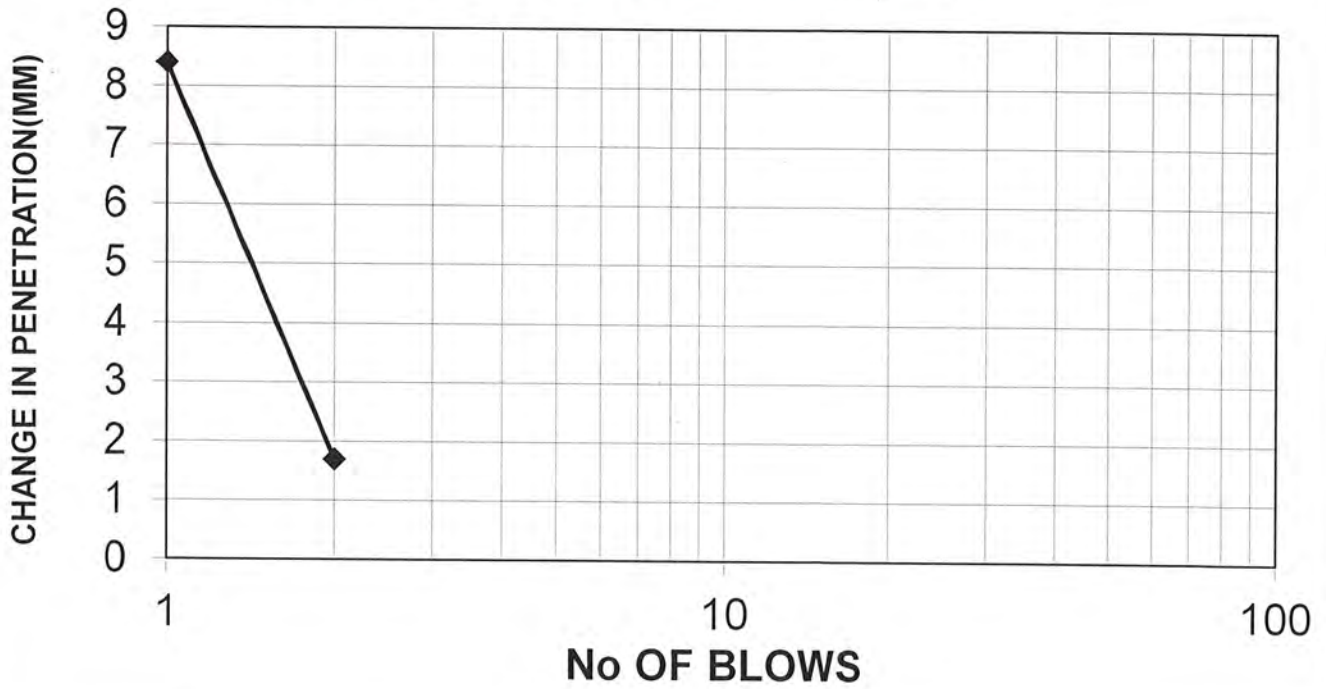
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.20m  
**Sample No:** BH SBC020 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



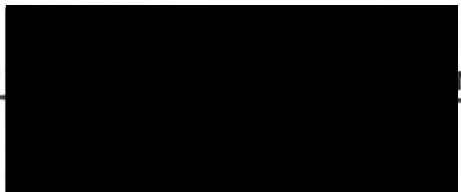
Sample	NAT
MCV	1.6
M.C.(%)	21
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 5.3% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

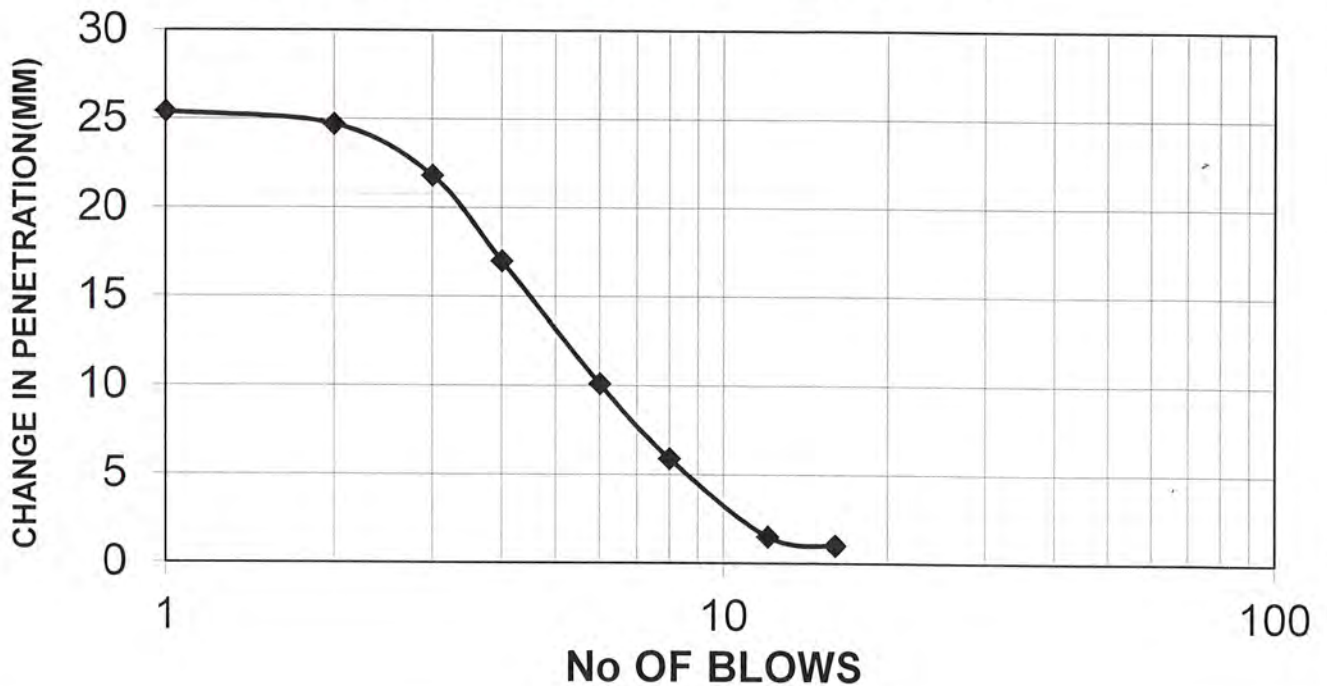


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 3.00m  
**Sample No:** BH SBC020 B13      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



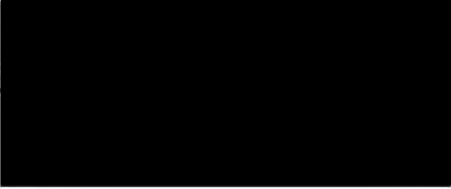
Sample	NAT
MCV	9.4
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 1.7% Retained on 20mm sieve  
 Insufficient sample for 5 point test

DATE TESTED: 05/05/2021

DATE OF ISSUE: 09/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell

Chester-le-Street , Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**


No. 1367

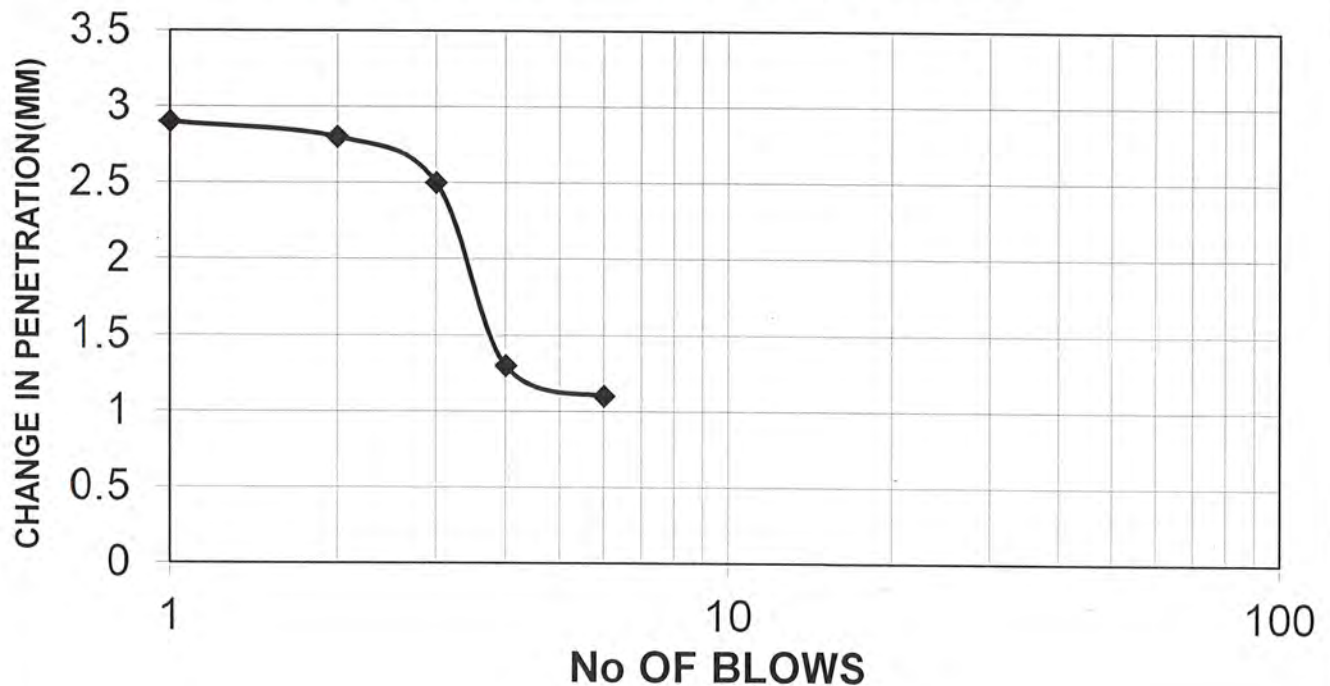
**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A

**CLIENT:** AMEY OW Limited      **Depth:** 6.00m

**Sample No:** BH SBC020 B21      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

### CHANGE IN PENETRATION PLOT



Sample	NAT
MCV	U/S
M.C.(%)	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 3.9% Retained on 20mm sieve  
Test attempted material too soft for result

DATE TESTED: 29/04/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:

NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

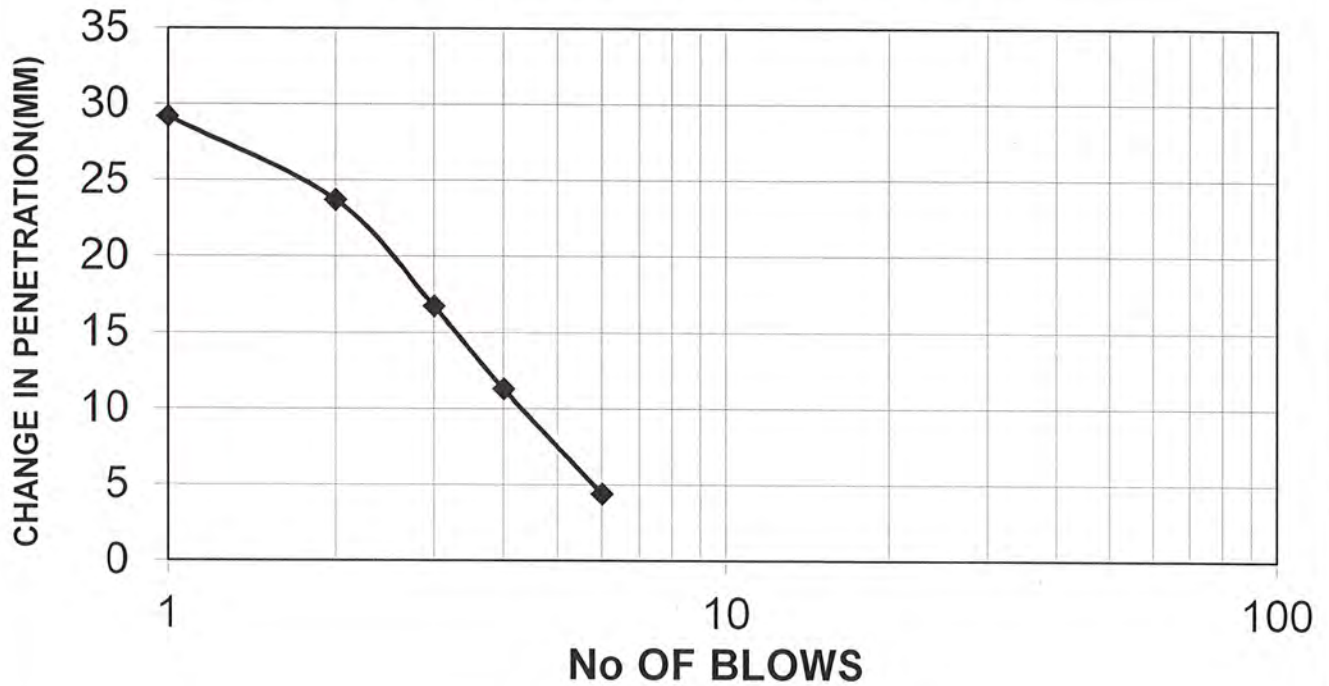


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.20m  
**Sample No:** BH SBC021 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



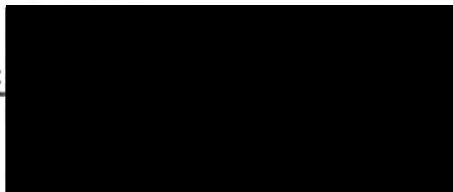
Sample	NAT
MCV	7.6
M.C.(%)	18
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 8.5% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367



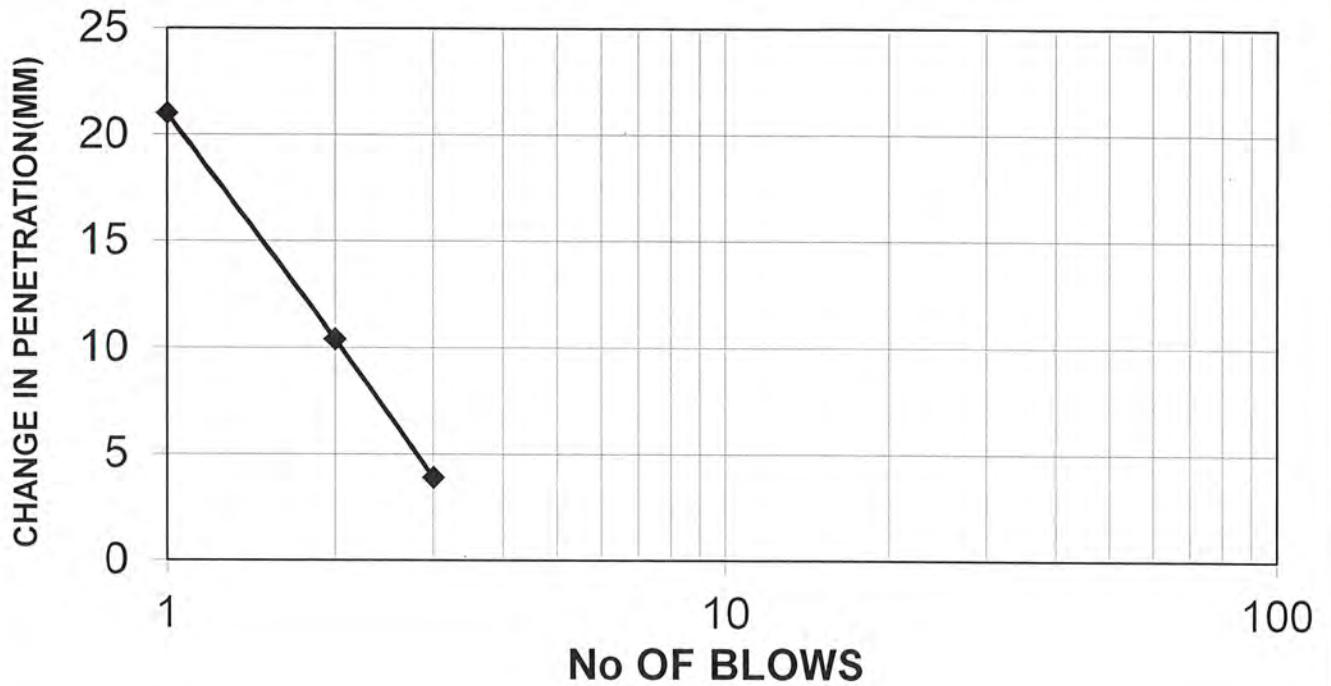
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.80m  
**Sample No:** BH SBC021 B20      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



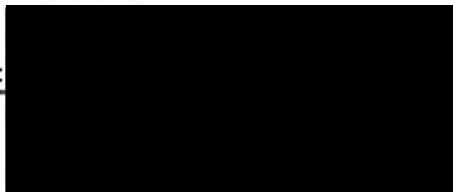
Sample	NAT
MCV	4.5
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 2.4% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk





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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

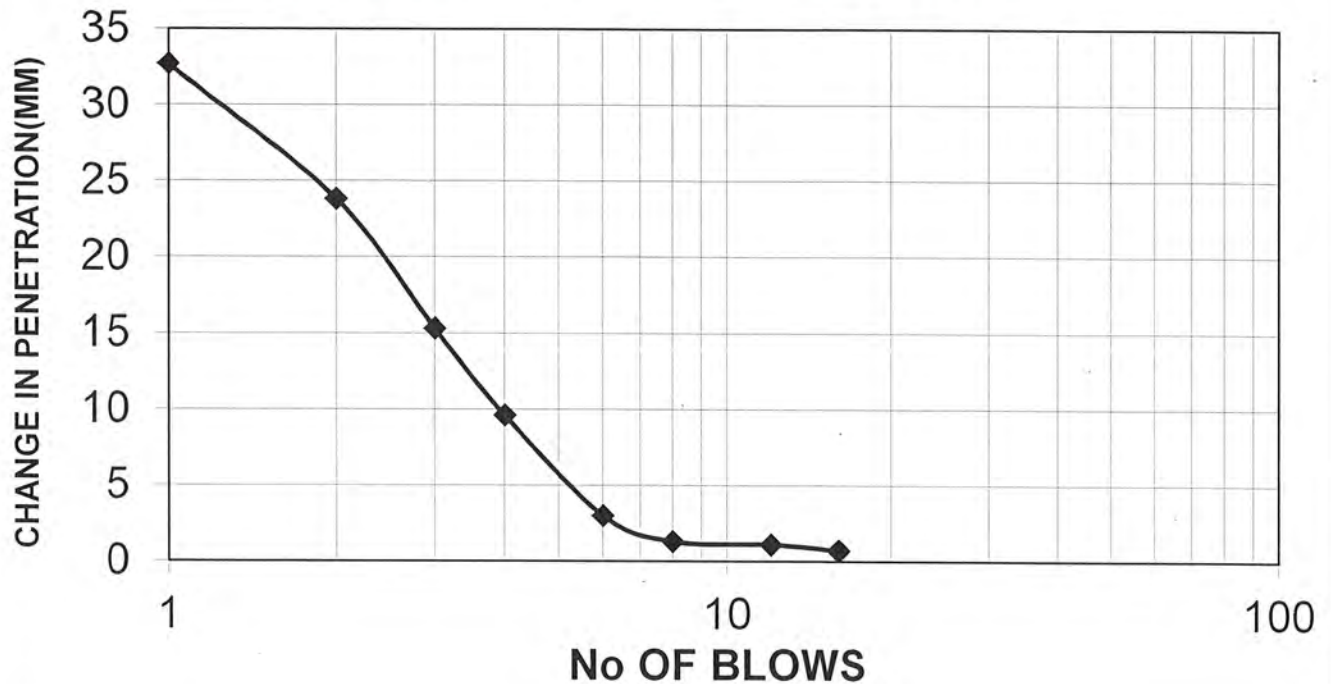


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.20m  
**Sample No:** BH SBC023A B13      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



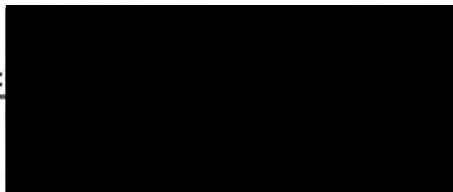
Sample	NAT
MCV	7.3
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.1% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

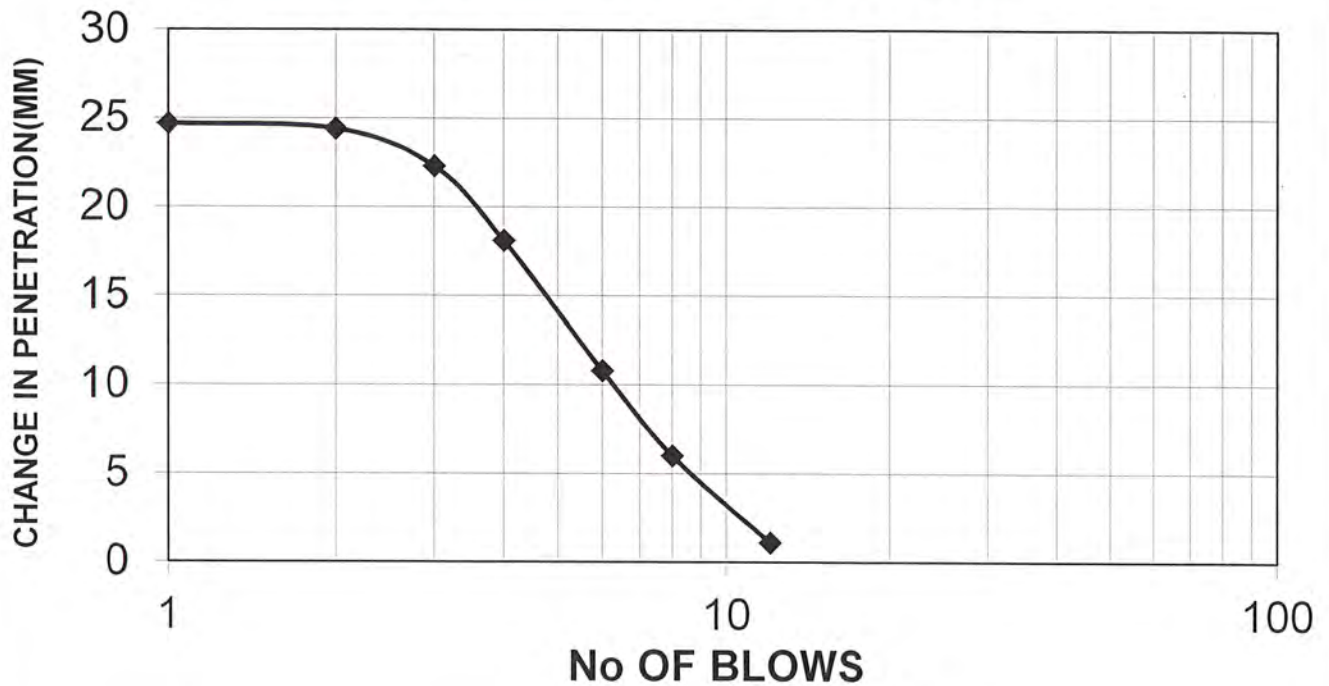


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 3.70m  
**Sample No:** BH SBC023A B16      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



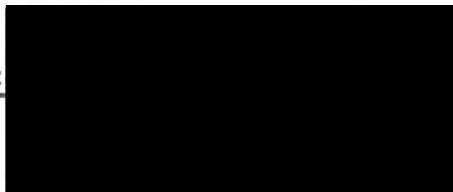
Sample	NAT
MCV	9.4
M.C.(%)	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 8.5% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

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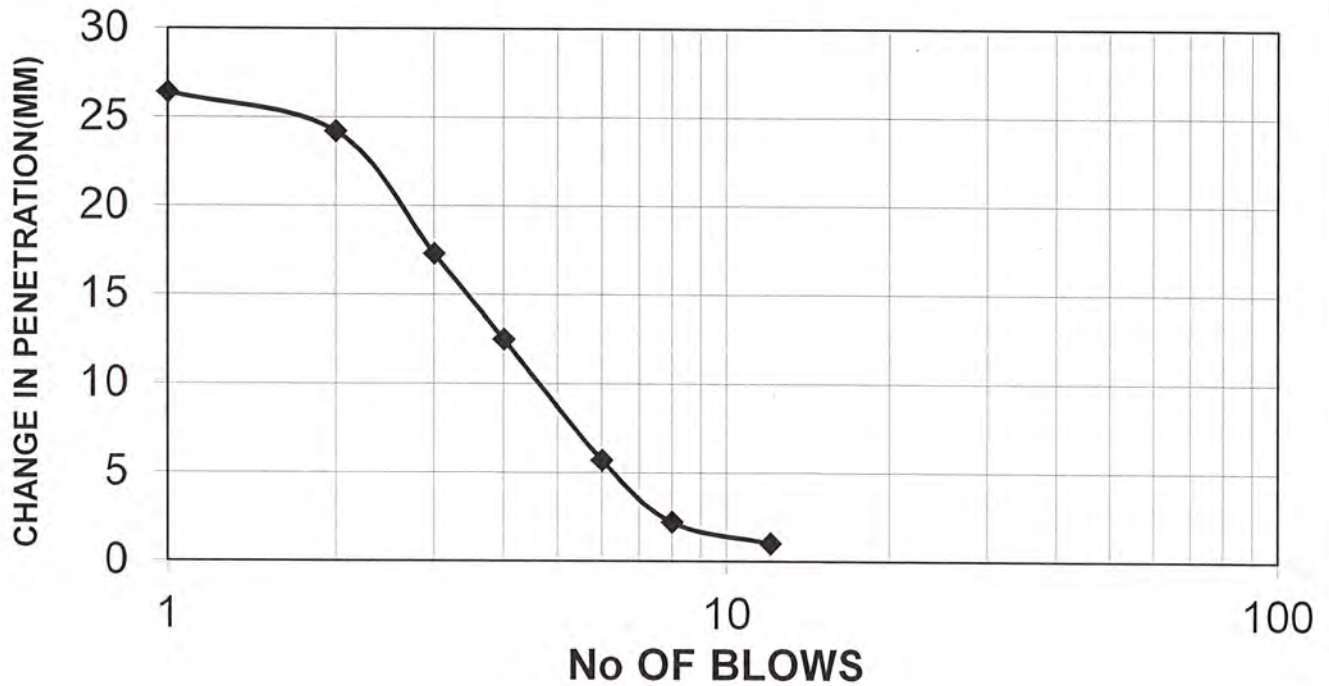
No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 5.40m  
**Sample No:** BH SBC023A B20      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



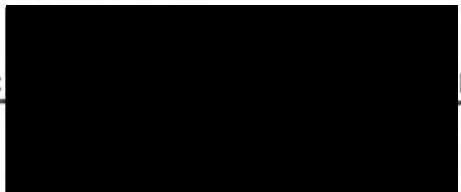
Sample	NAT
MCV	8.0
M.C.(%)	15
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 4.0% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

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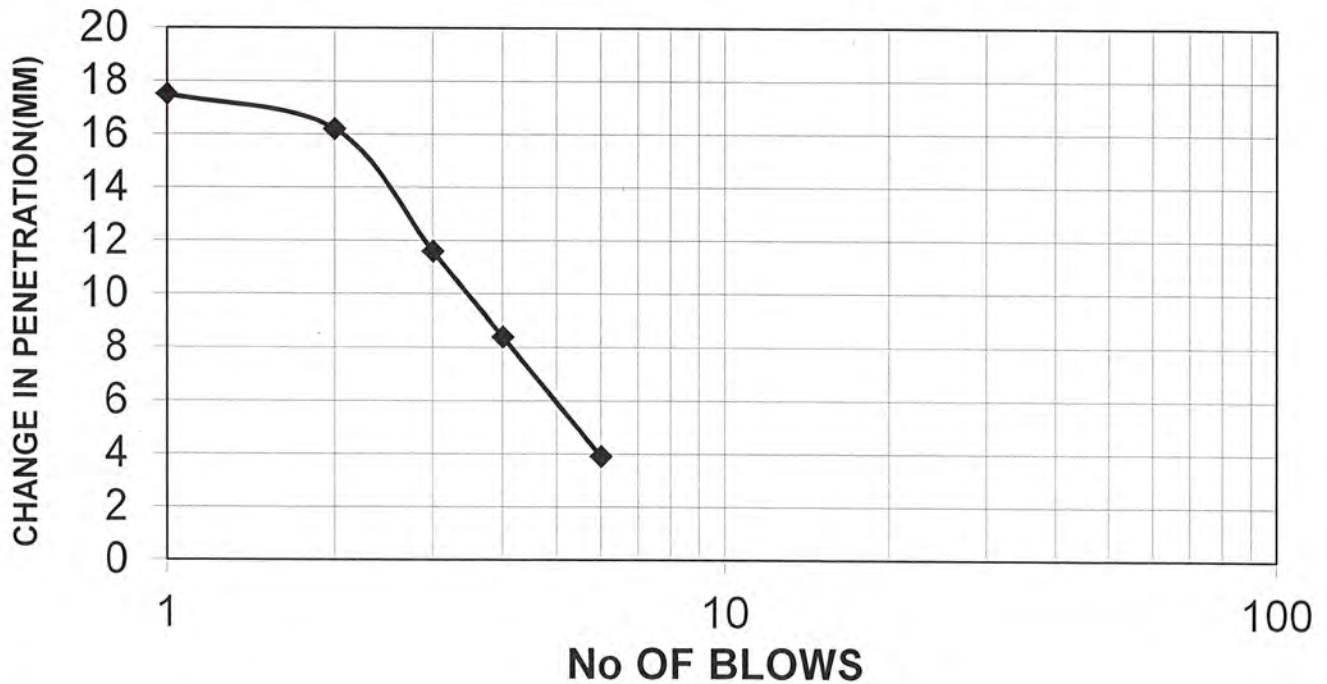
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.60m  
**Sample No:** BH SBC024 B2      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



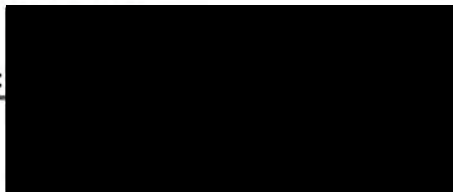
Sample	NAT
MCV	7.4
M.C.(%)	21
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

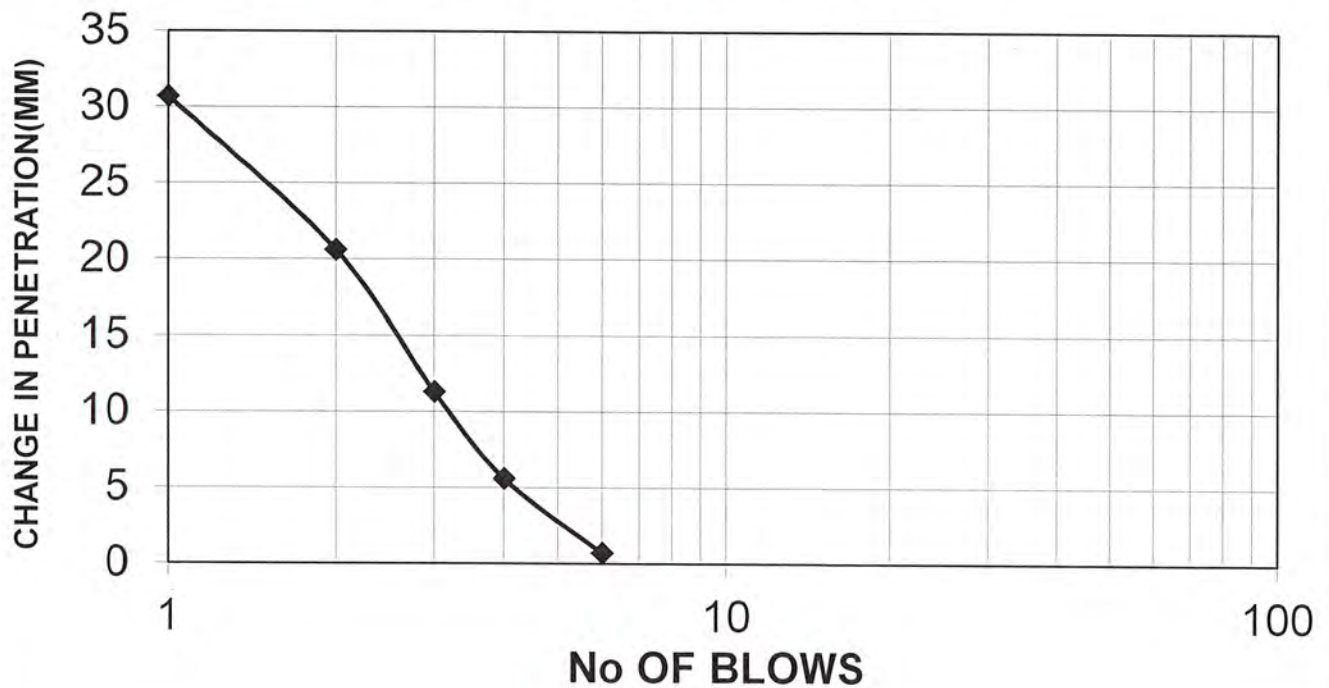


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.50m  
**Sample No:** BH SBC024 B10      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



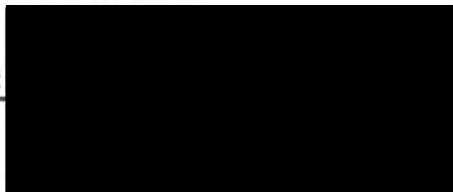
Sample	NAT
MCV	6.3
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 7.8% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

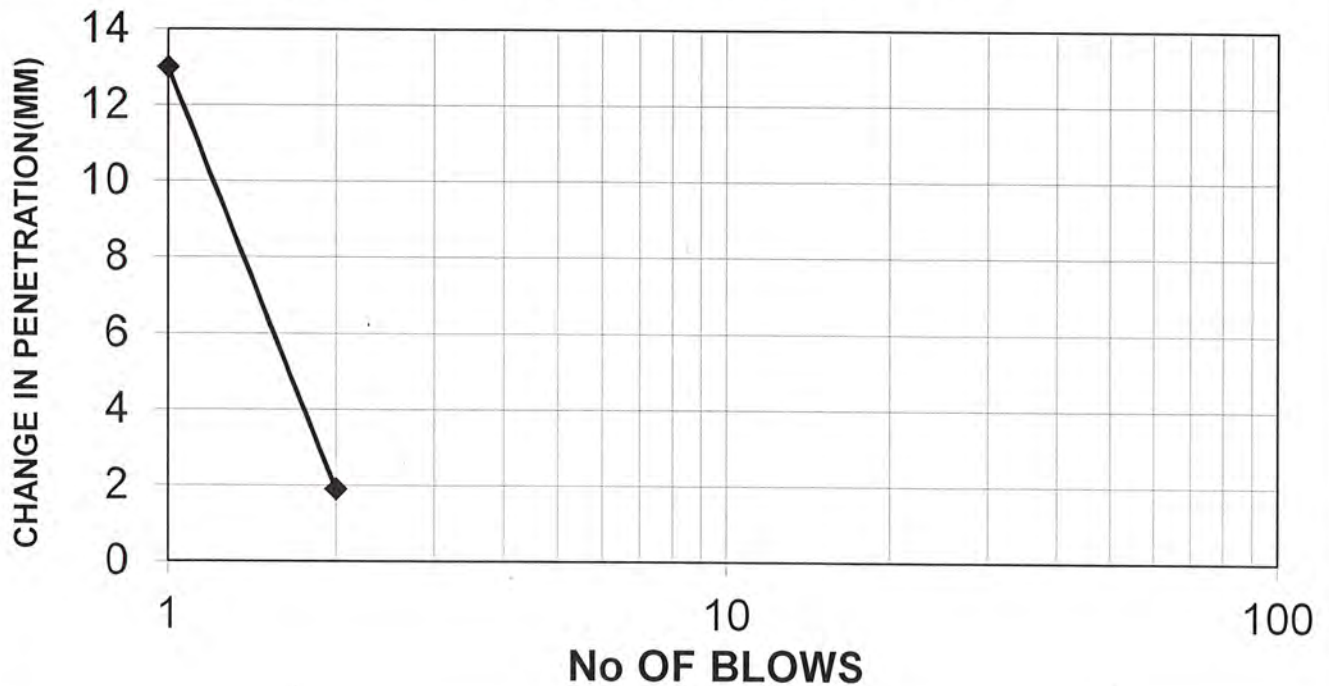


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.40m  
**Sample No:** BH SBC024 B15      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



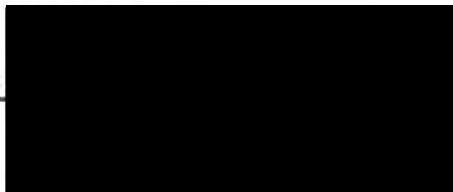
Sample	NAT
MCV	2.2
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 5.4% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 03/06/2021

APPROVED BY:



NAME: Michelle Selkirk





## ALLIED EXPLORATION & GEOTECHNICS LIMITED

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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

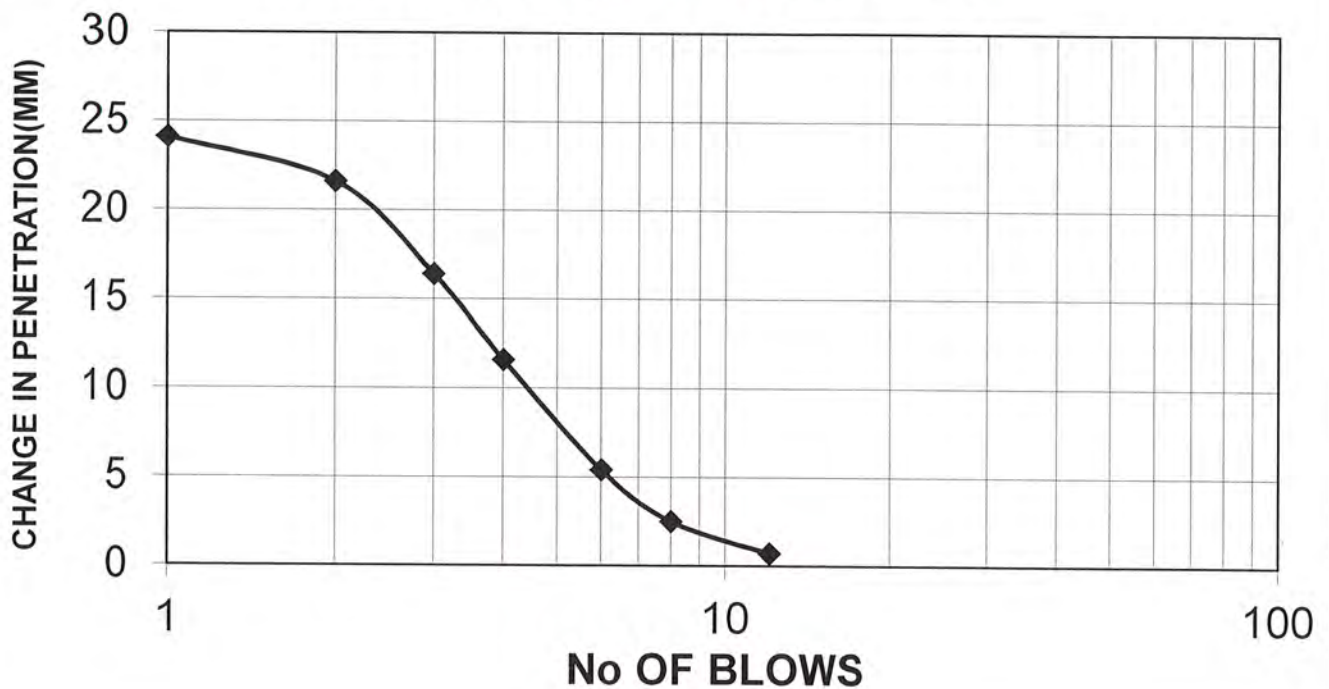


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	5.50m
<b>Sample No:</b>	BH SBC24 B20	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

### CHANGE IN PENETRATION PLOT



Sample	NAT
MCV	7.9
M.C.(%)	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 19.7% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:

NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367



**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.50m  
**Sample No:** BH SBC026 B4      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



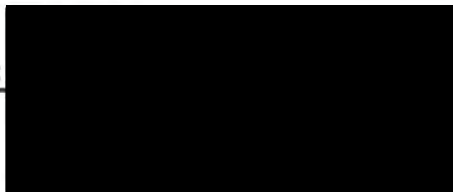
Sample	NAT
MCV	8.5
M.C.(%)	27
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 8.9% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 01/06/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367



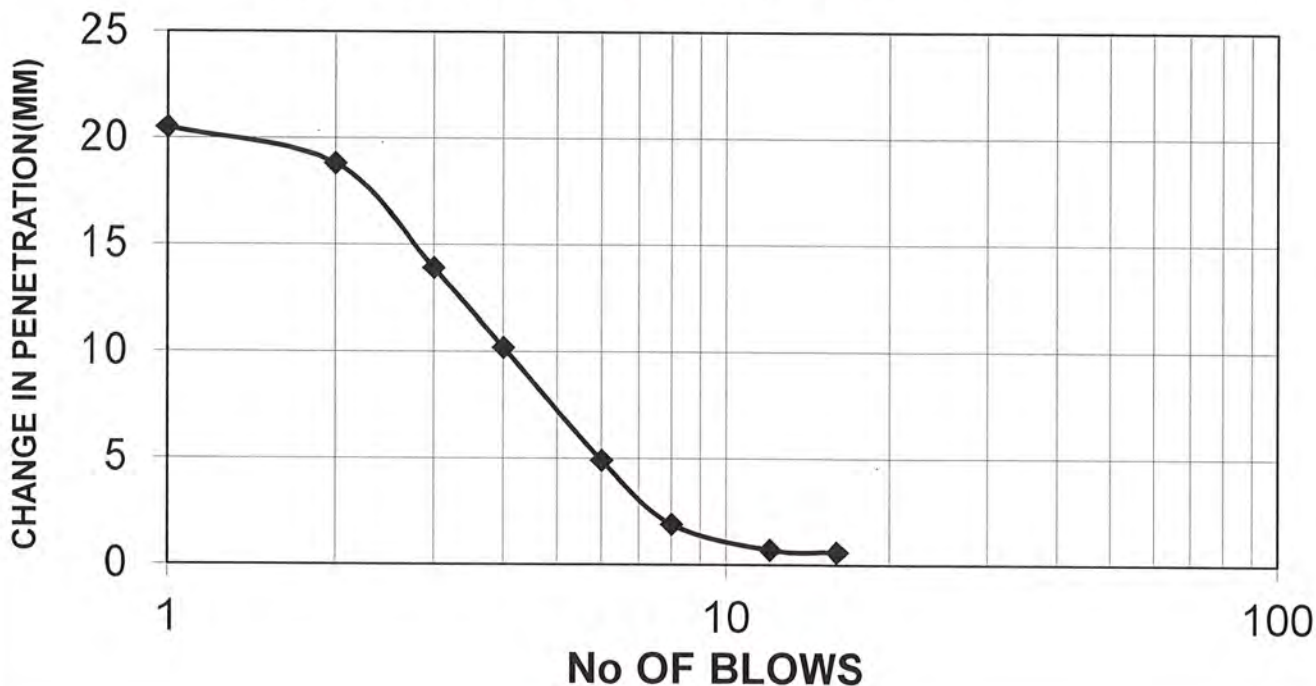
No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 3.40m  
**Sample No:** BH SBC026 B15      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



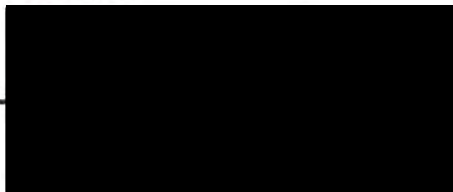
Sample	NAT
MCV	7.7
M.C.(%)	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 14.9% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

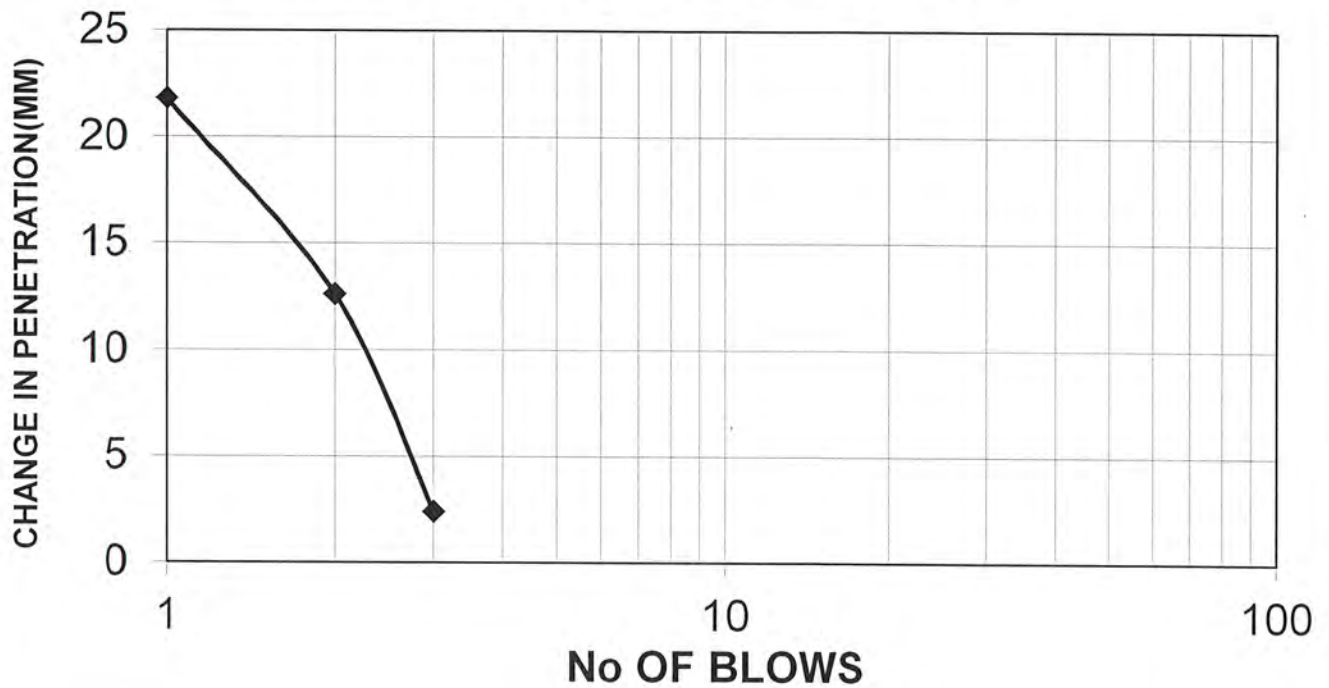


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	6.10m
<b>Sample No:</b>	BH SBC026 B23	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



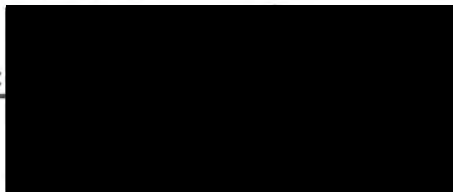
Sample	NAT
MCV	4.4
M.C.(%)	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 24.8% Retained on 20mm sieve

DATE TESTED: 28/05/2021

DATE OF ISSUE: 03/06/2021

APPROVED BY:



NAME: Michelle Selkirk





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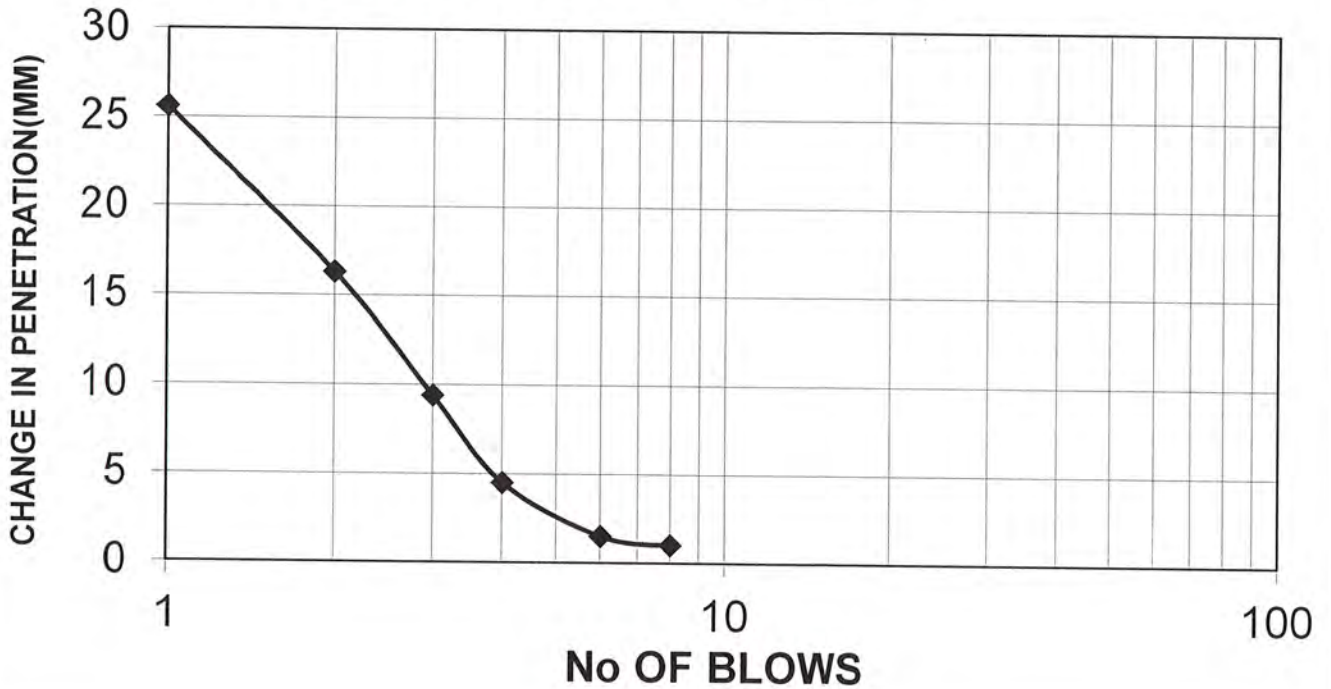
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.2m  
**Sample No:** BH SBC029 B8      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



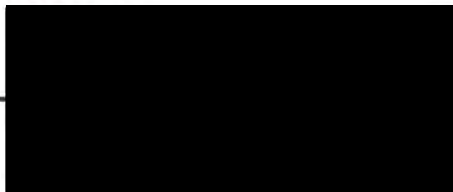
Sample	NAT
MCV	5.8
M.C.(%)	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

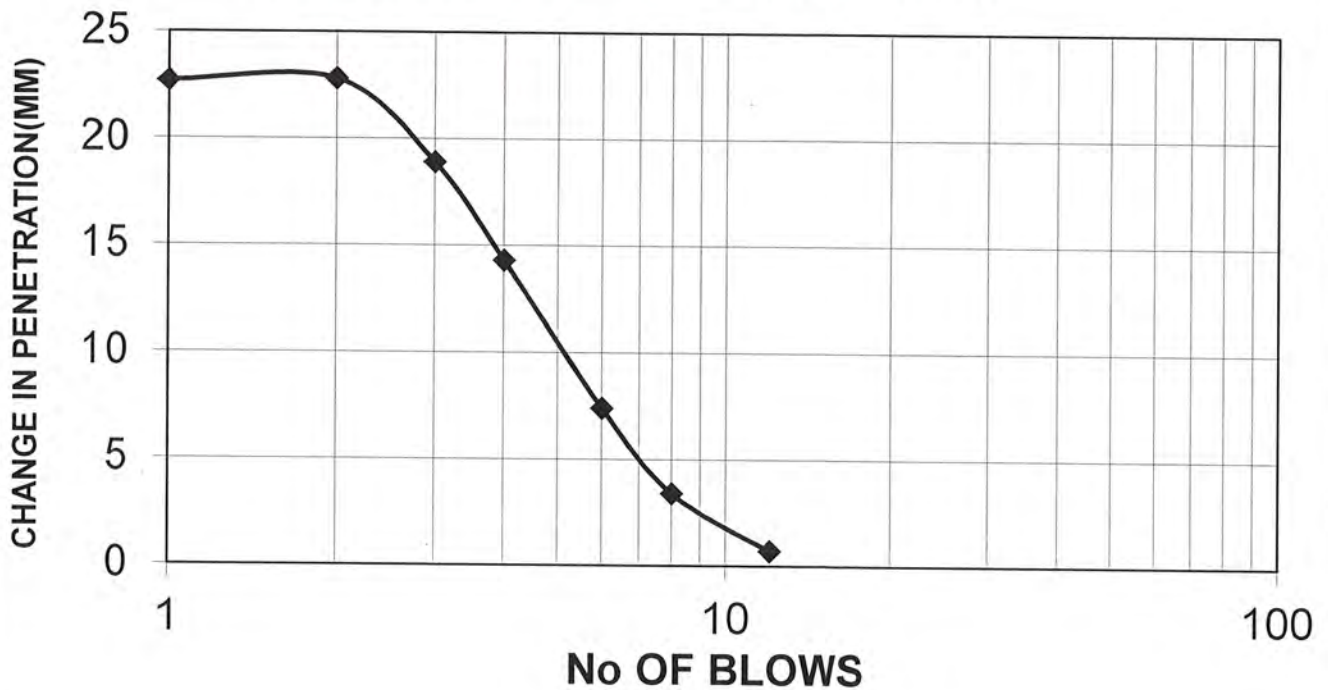


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** BH SBC030 B7      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



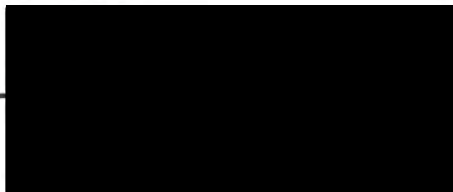
Sample	NAT
MCV	8.5
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 5.9% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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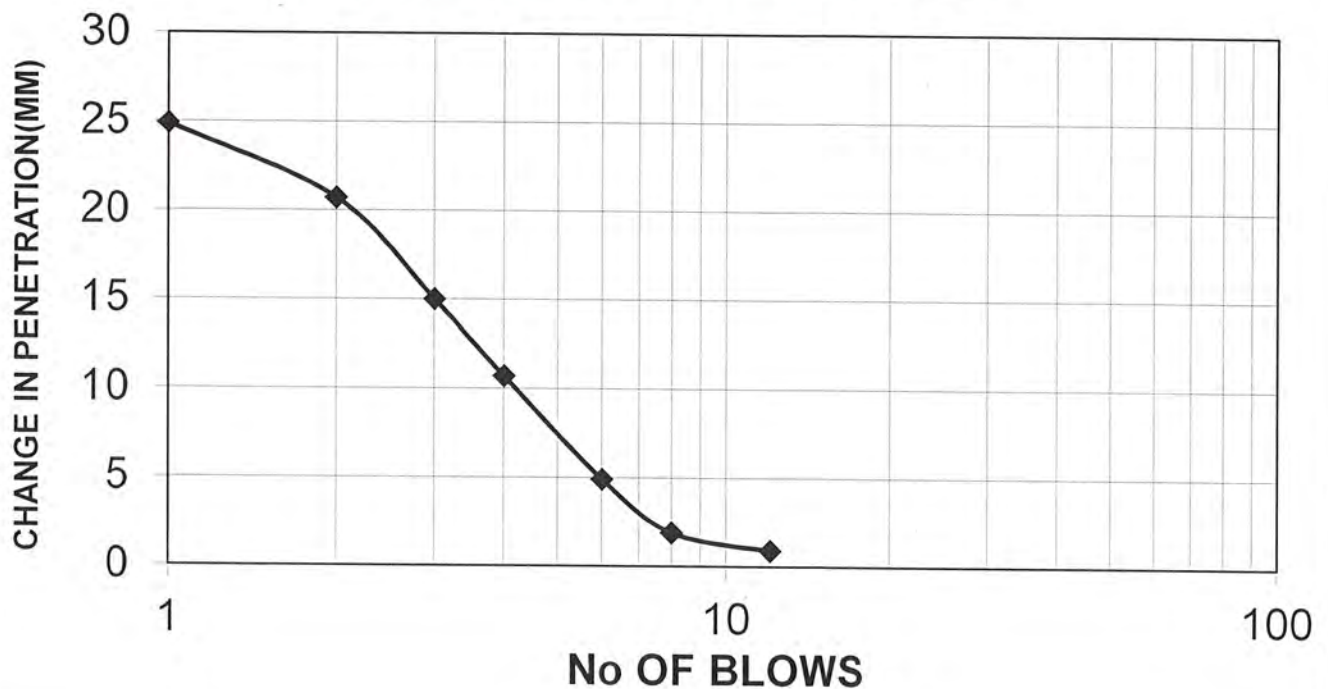
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.20m  
**Sample No:** BH SBC030 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



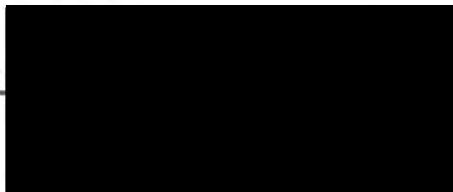
Sample	NAT
MCV	7.7
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 8.5% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

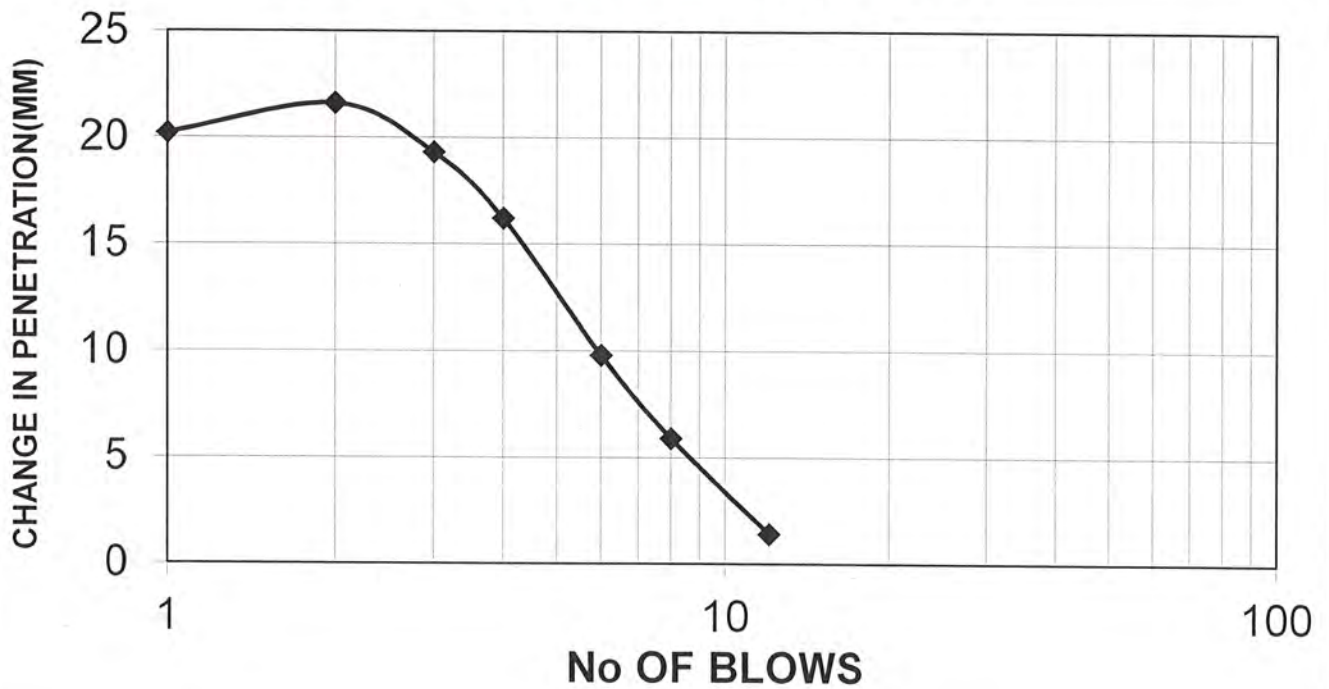


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.50m  
**Sample No:** TP SBC002 B7      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



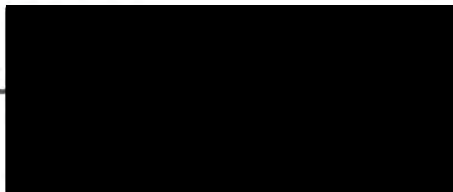
Sample	NAT
MCV	9.3
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 5.5% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk





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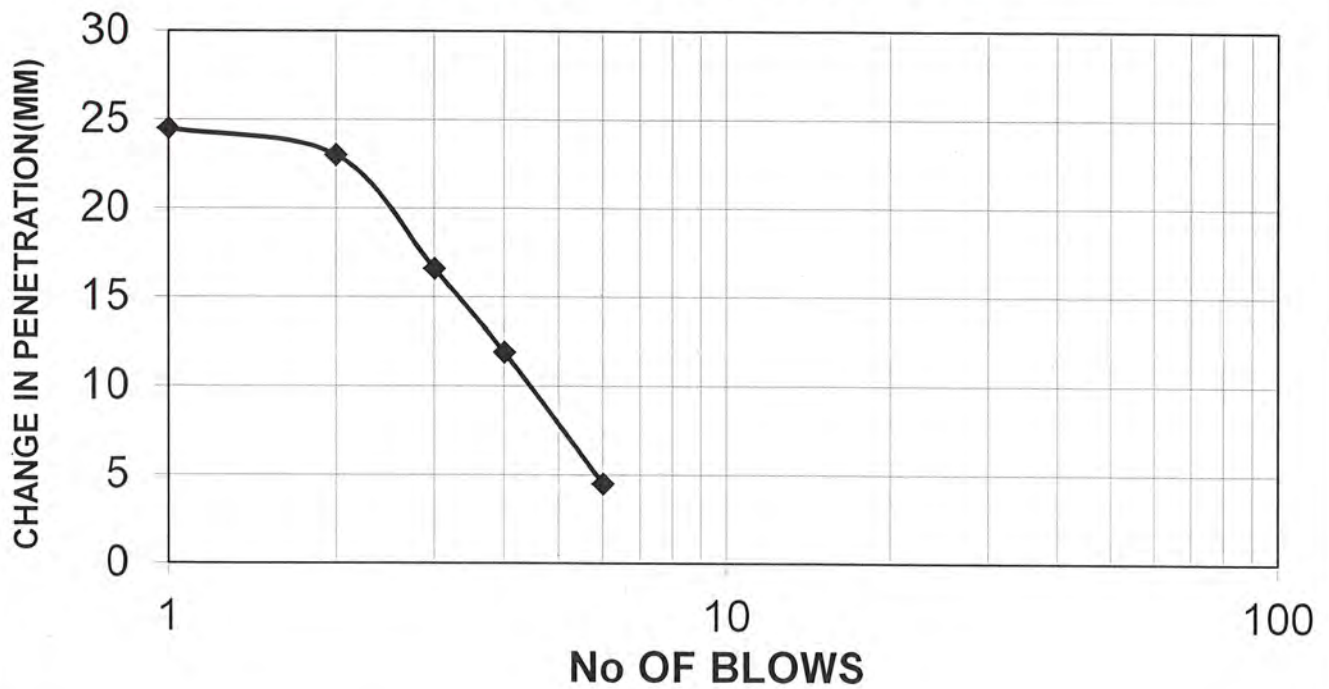
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.50m  
**Sample No:** TP SBC003 B4      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



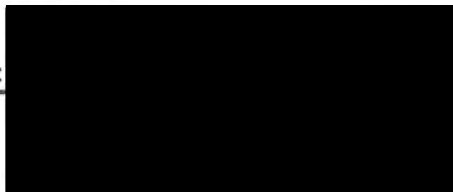
Sample	NAT
MCV	7.8
M.C.(%)	22
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 1.0% Retained on 20mm sieve

DATE TESTED: 24/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk



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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

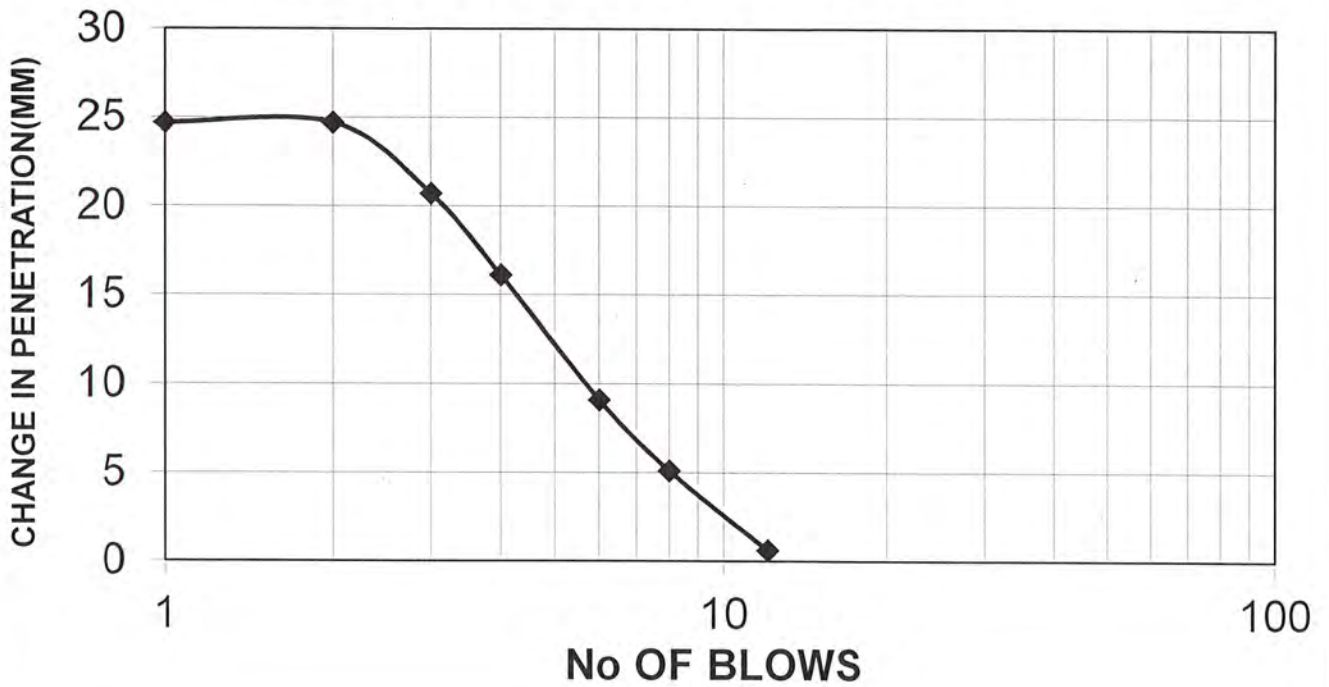


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.50m  
**Sample No:** TP SBC003 B10      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



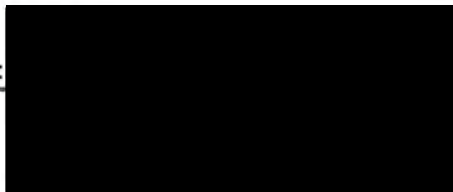
Sample	NAT
MCV	9.0
M.C.(%)	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 3.4% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk





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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 3.00m  
**Sample No:** TP SBC010 B11      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



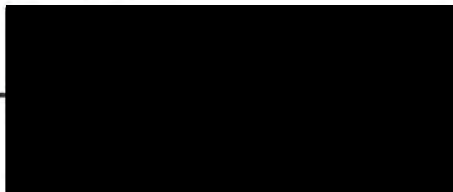
Sample	NAT
MCV	8.4
M.C.(%)	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 9.3% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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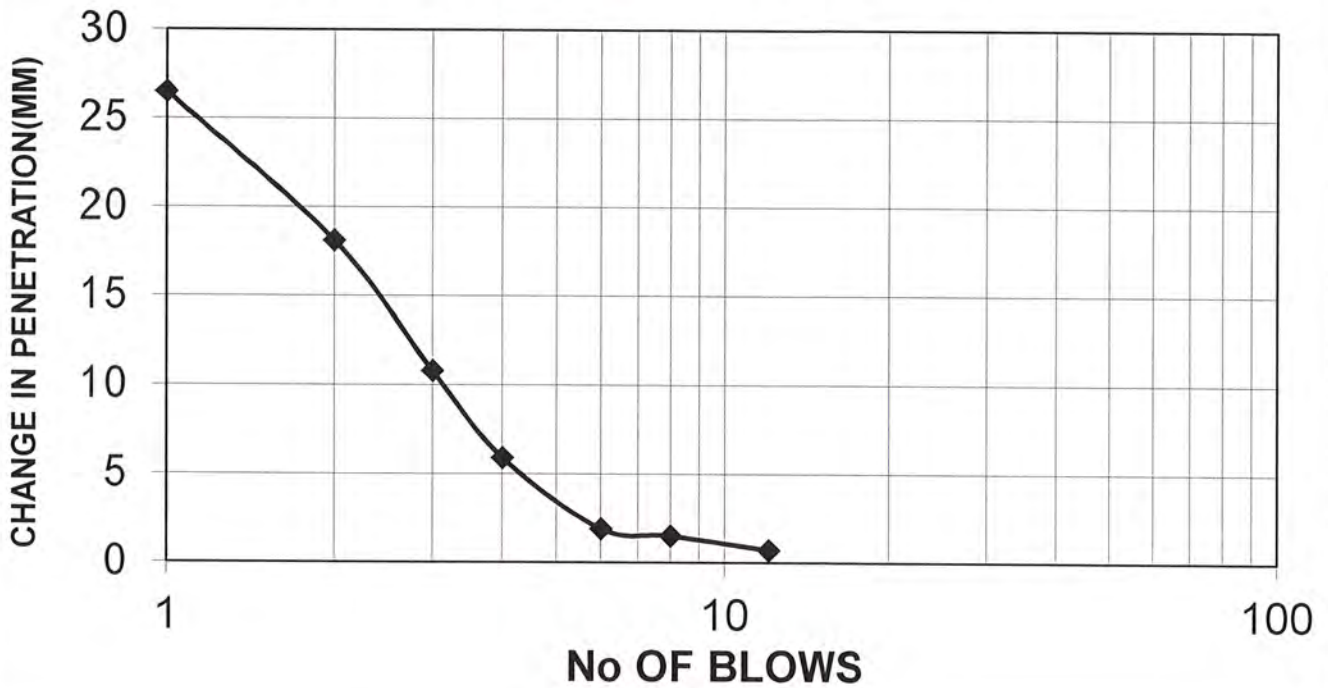
No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.40m  
**Sample No:** TP SBC011 B4      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



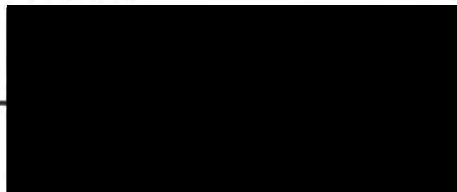
Sample	NAT
MCV	6.3
M.C.(%)	28
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 5.8% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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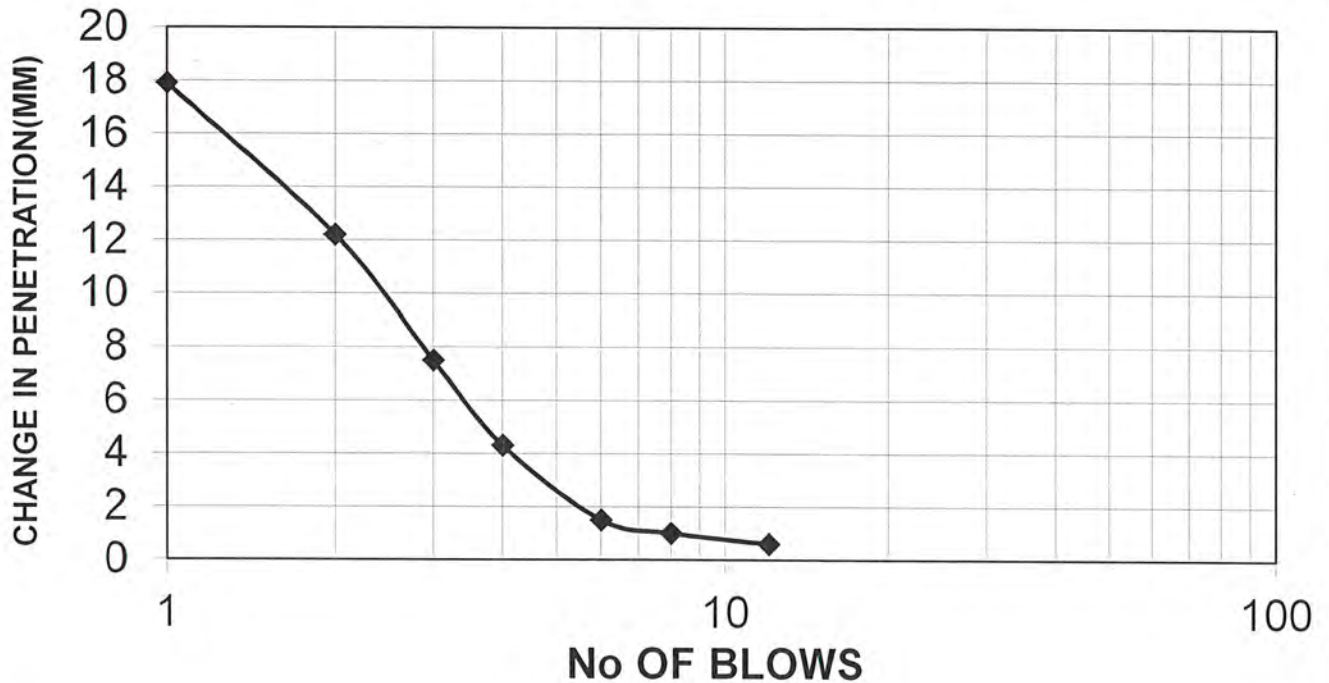
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	1.00m
<b>Sample No:</b>	TP SBC012A B2	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



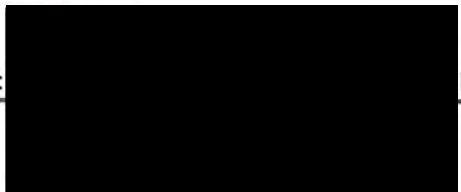
Sample	NAT
MCV	5.7
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.5% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

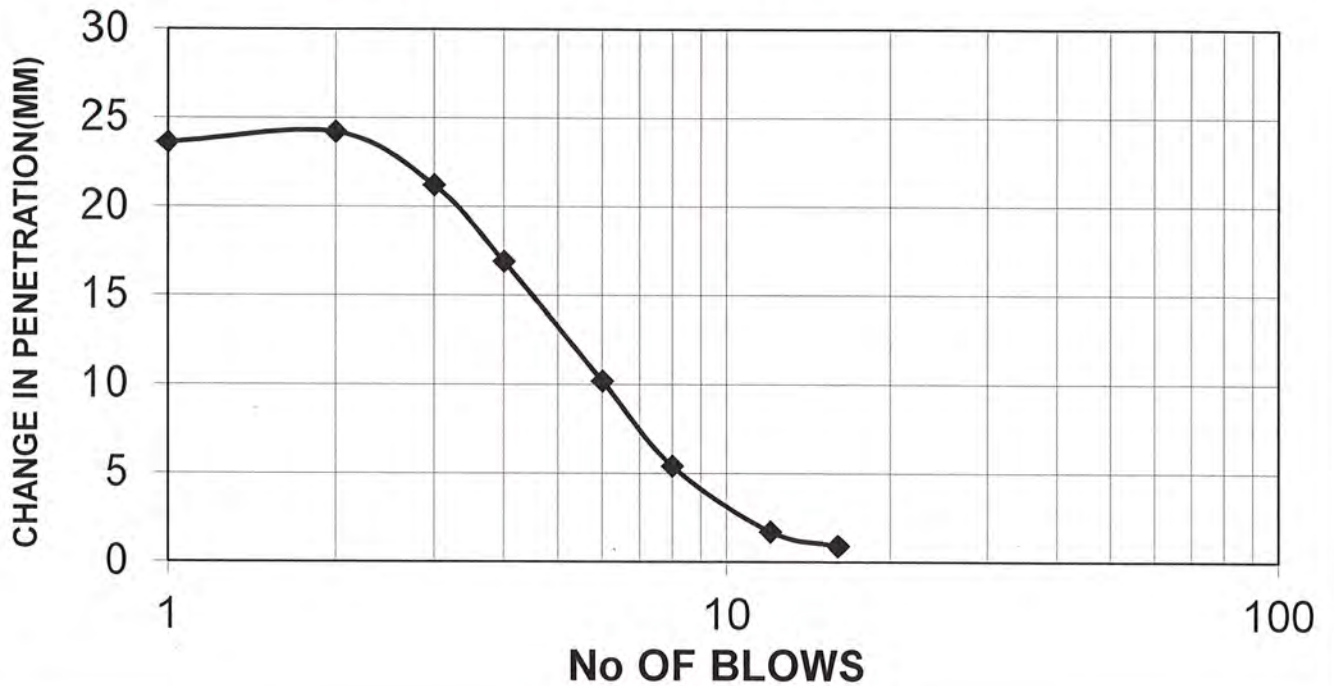


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	3.00m
<b>Sample No:</b>	TP SBC012A B10	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



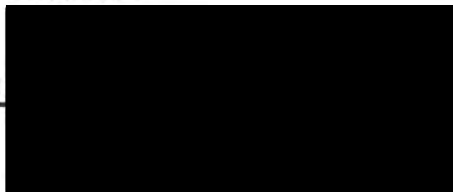
Sample	NAT
MCV	9.2
M.C.(%)	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 5.2% Retained on 20mm sieve

DATE TESTED: 24/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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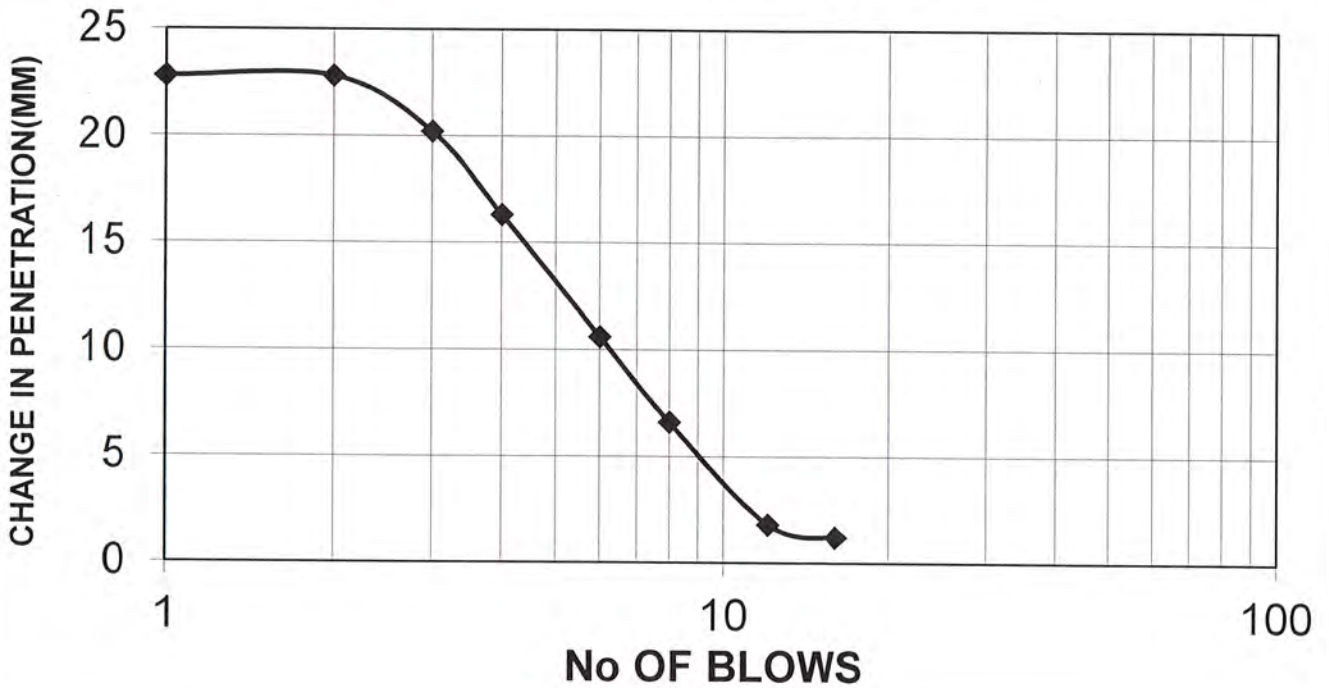
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC013 B7      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



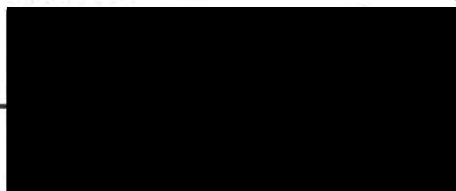
Sample	NAT
MCV	9.6
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 10.5% Retained on 20mm sieve

DATE TESTED: 23/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.8m  
**Sample No:** TP SBC014 B6      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



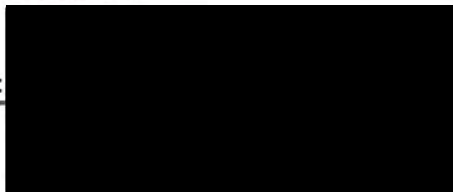
Sample	NAT
MCV	3.1
M.C.(%)	25
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 8.7% Retained on 20mm sieve

DATE TESTED: 23/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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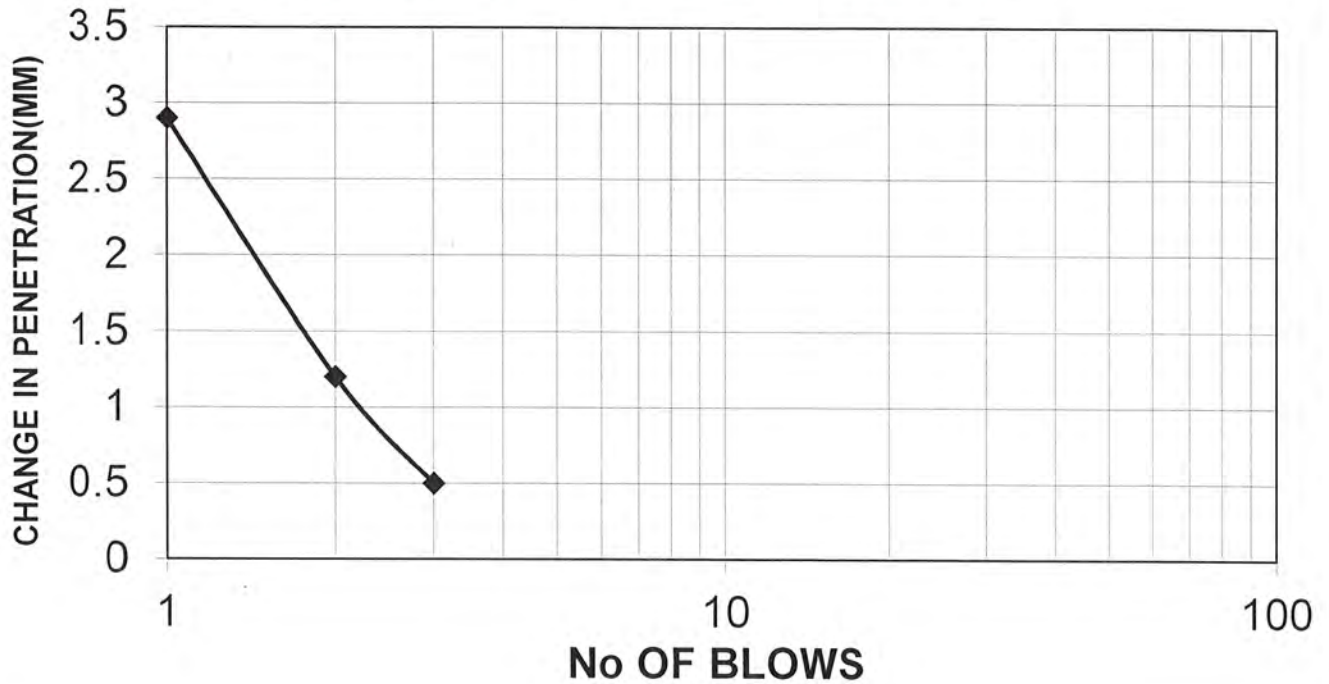
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC014 B11      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



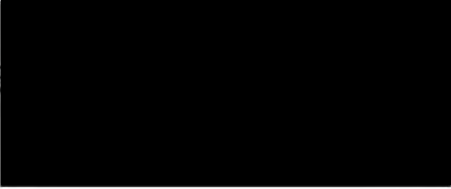
Sample	NAT
MCV	N/A
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 43.9% Retained on 20mm sieve  
 Test attempted but unable to obtain MCV result due to sample being too wet

DATE TESTED: 22/06/2021

DATE OF ISSUE: 09/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

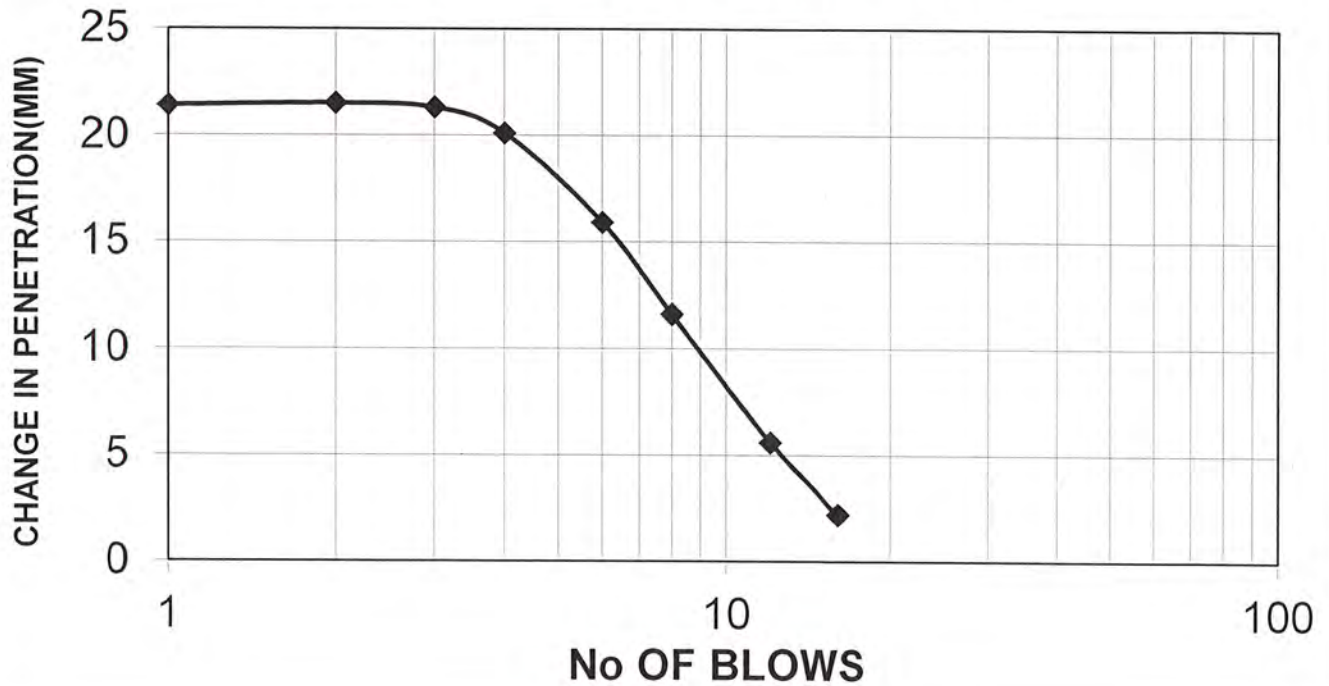


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.20m  
**Sample No:** TP SBC017 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



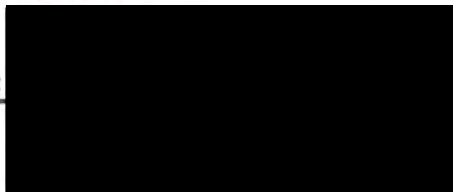
Sample	NAT
MCV	11.0
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 0% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

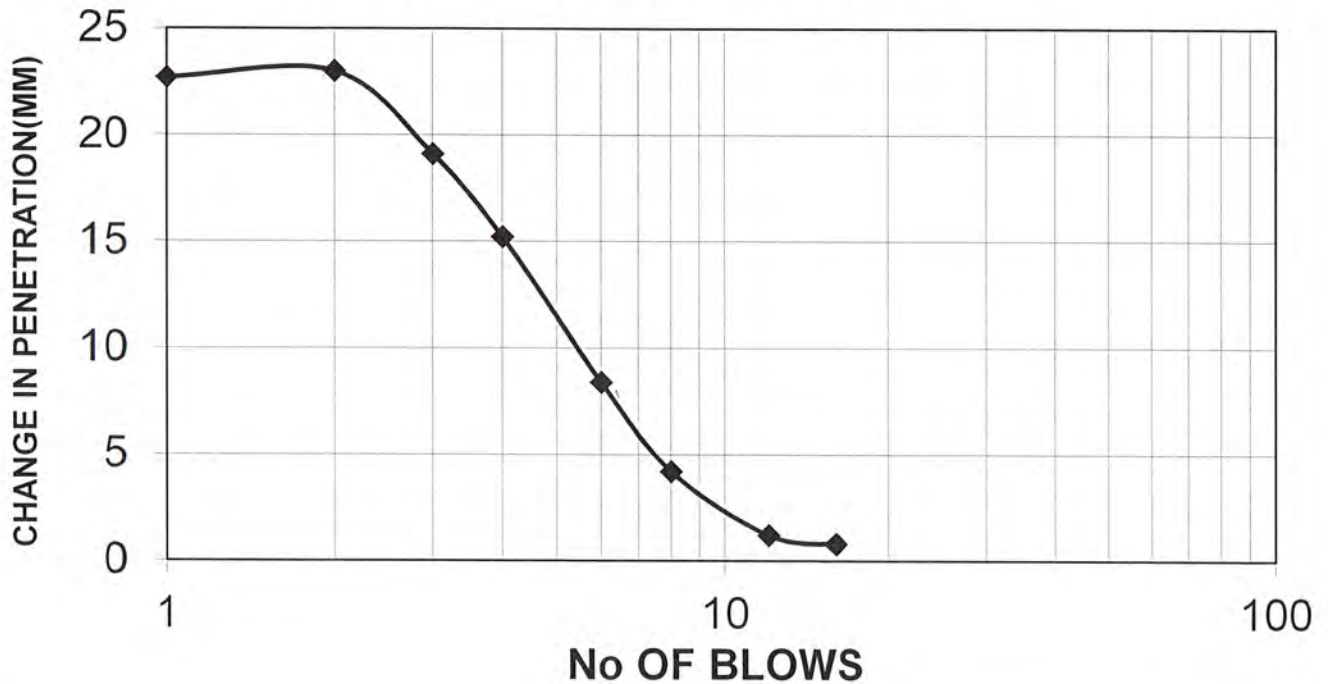


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC018 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



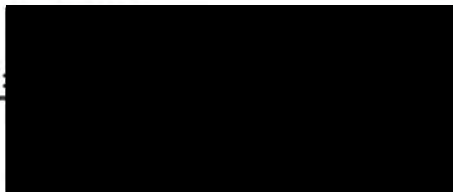
Sample	NAT
MCV	8.8
M.C.(%)	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 6.2% Retained on 20mm sieve  
 Insufficient sample for 5 point test

DATE TESTED: 07/05/2021

DATE OF ISSUE: 09/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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 a UKAS Testing Laboratory No.1367



No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC021 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



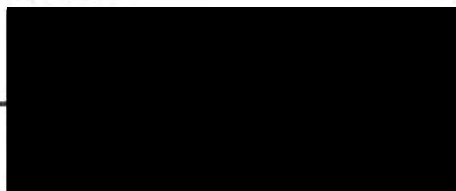
Sample	NAT
MCV	11.8
M.C.(%)	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 5.4% Retained on 20mm sieve

DATE TESTED: 23/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

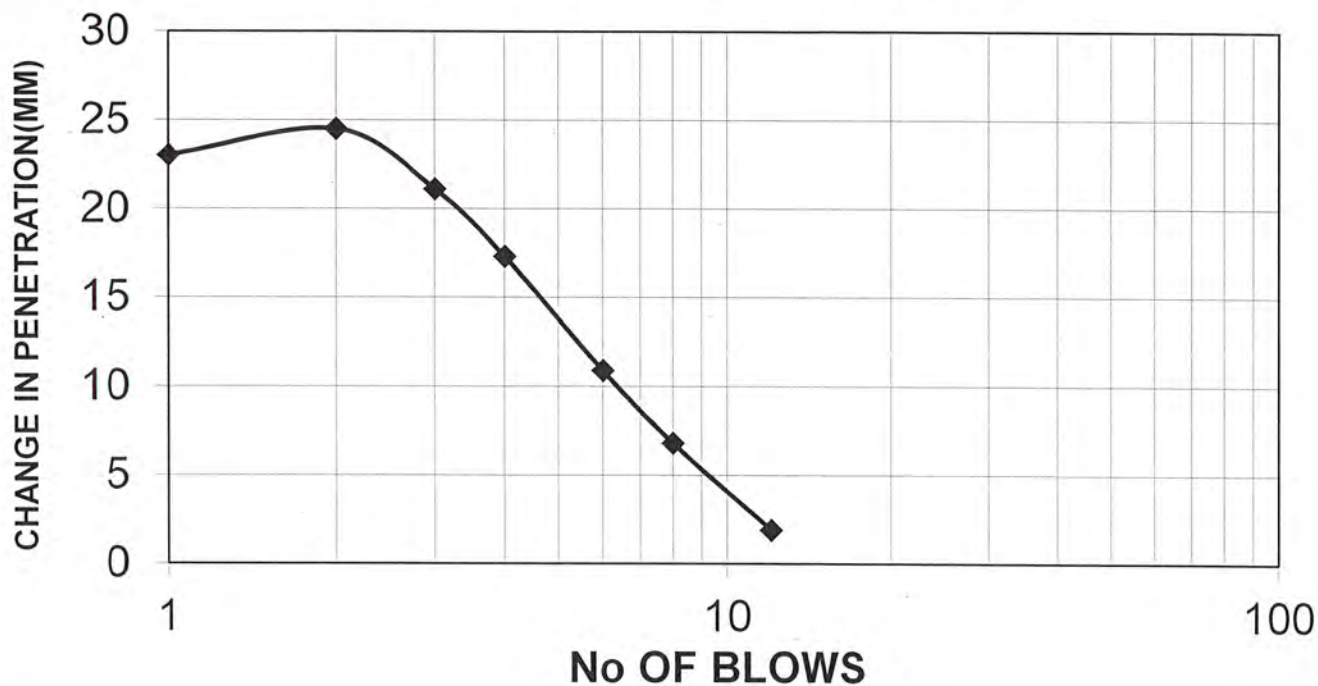


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC027 B4      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



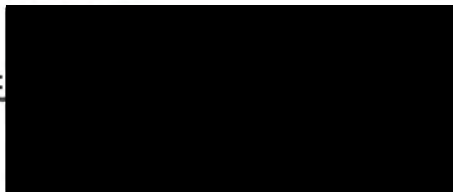
Sample	NAT
MCV	9.6
M.C.(%)	17
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.6% Retained on 20mm sieve

DATE TESTED: 23/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



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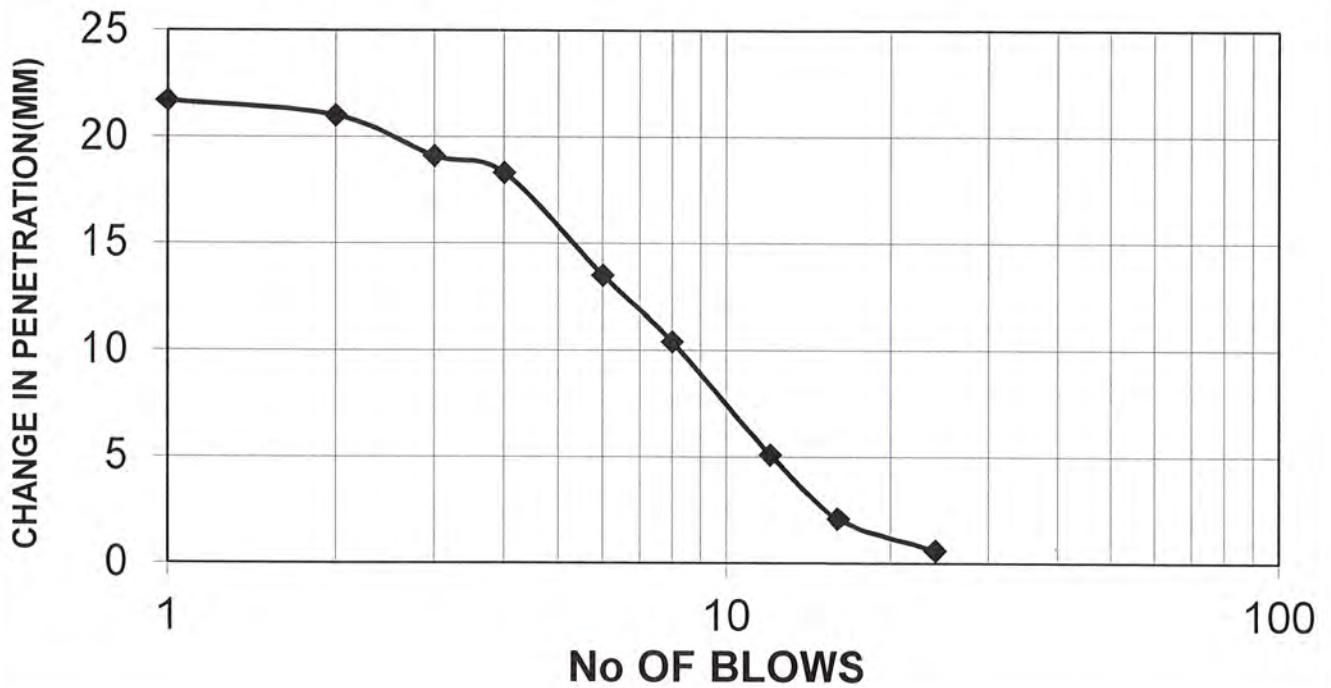
No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC027 B8      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



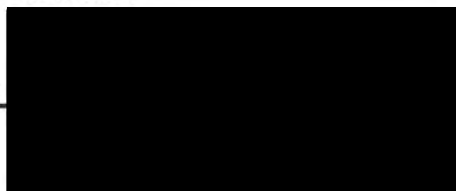
Sample	NAT
MCV	10.8
M.C.(%)	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.5% Retained on 20mm sieve

DATE TESTED: 21/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

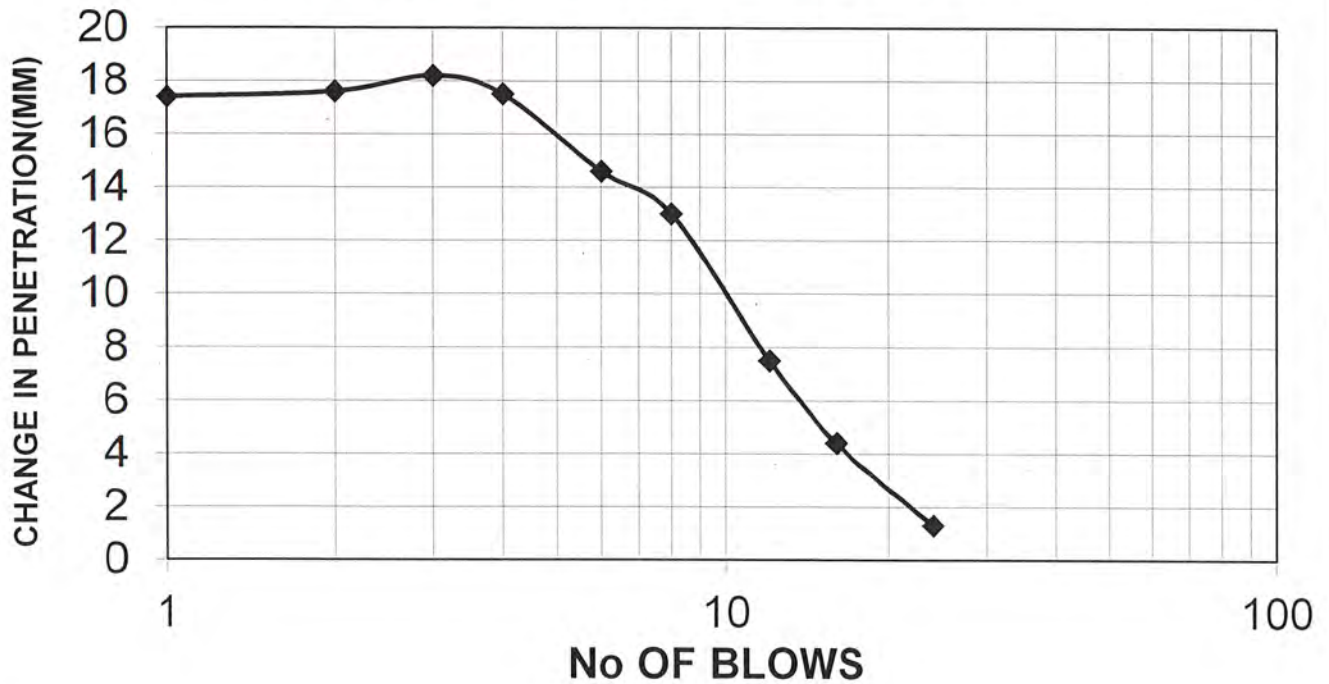


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 3.00m  
**Sample No:** TP SBC027 B11      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



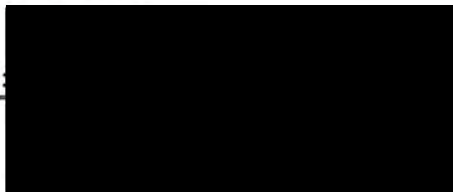
Sample	NAT
MCV	11.8
M.C.(%)	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.4% Retained on 20mm sieve  
 Insufficient sample for 5 point test

DATE TESTED: 06/05/2021

DATE OF ISSUE: 09/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

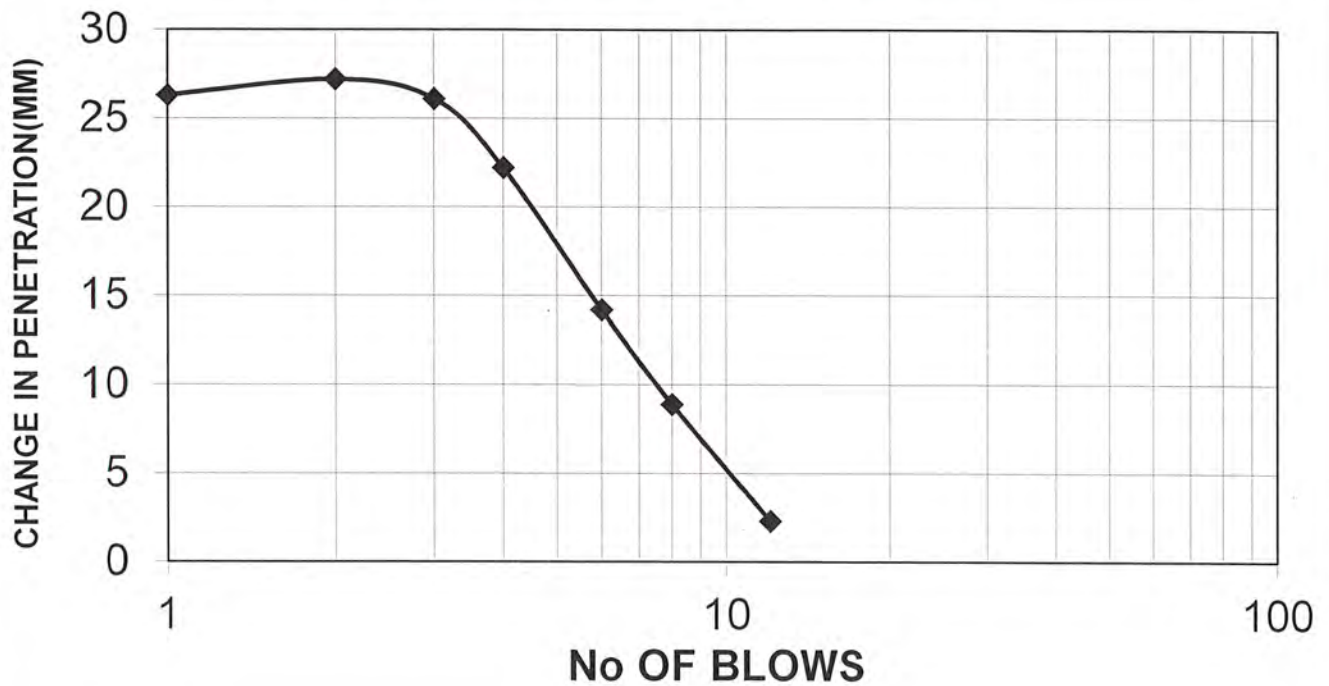


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	1.00m
<b>Sample No:</b>	TP SBC028 B6	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



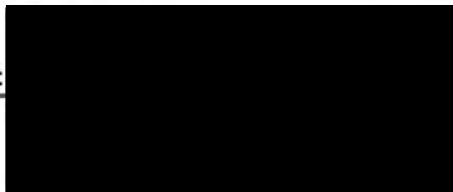
Sample	NAT
MCV	10.1
M.C.(%)	19
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 3.4% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

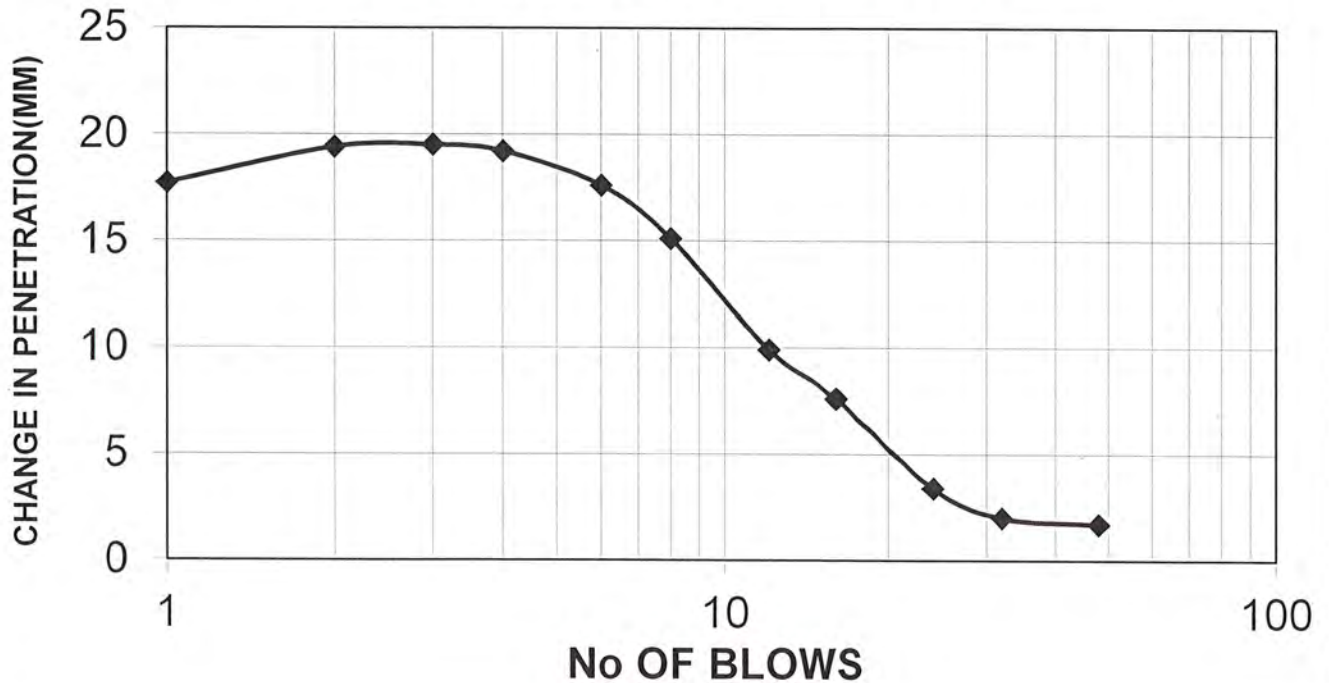


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	3.00m
<b>Sample No:</b>	TP SBC028 B13	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



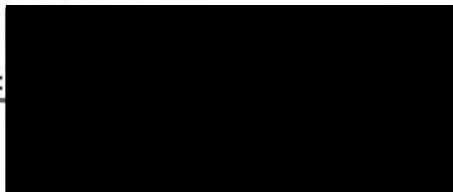
Sample	NAT
MCV	13.1
M.C.(%)	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 6.2% Retained on 20mm sieve

DATE TESTED: 22/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



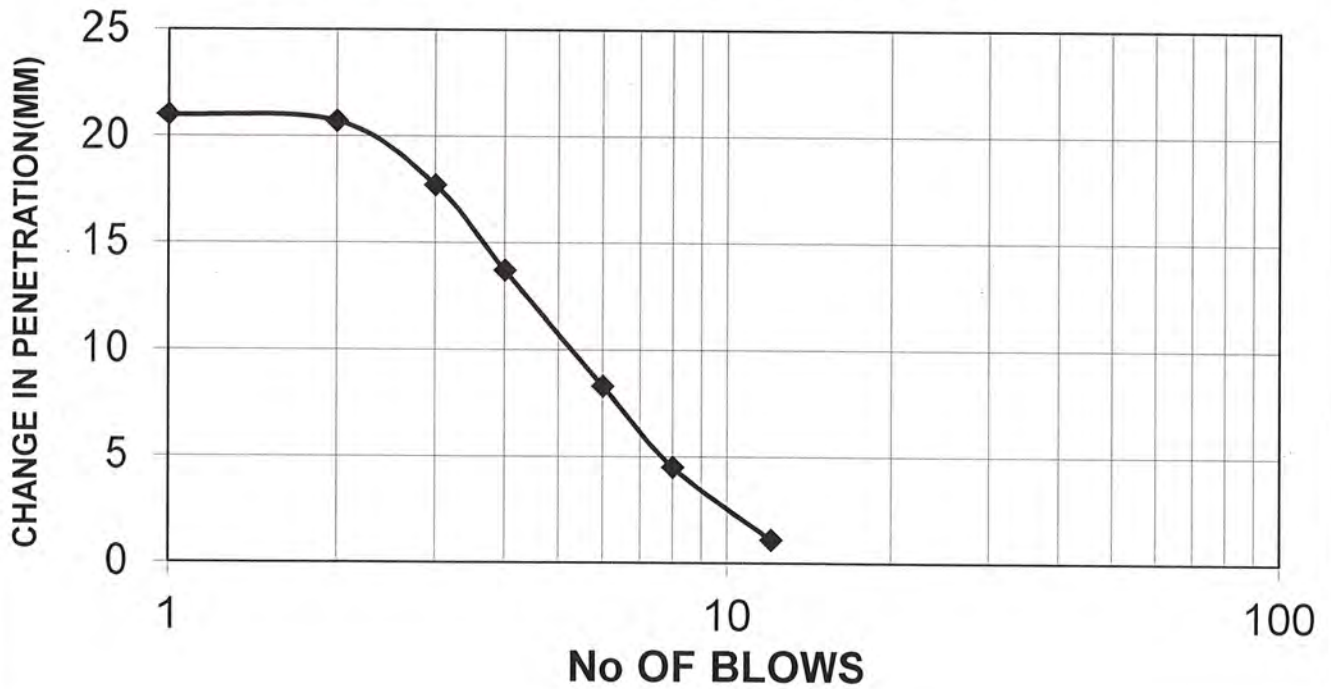
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC031 B9      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



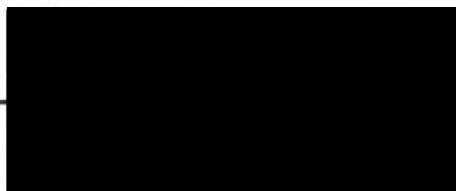
Sample	NAT
MCV	8.8
M.C.(%)	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

**Remarks:** 7.2% Retained on 20mm sieve

DATE TESTED: 21/06/2021

DATE OF ISSUE: 01/07/2021

APPROVED BY:



NAME: Michelle Selkirk





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



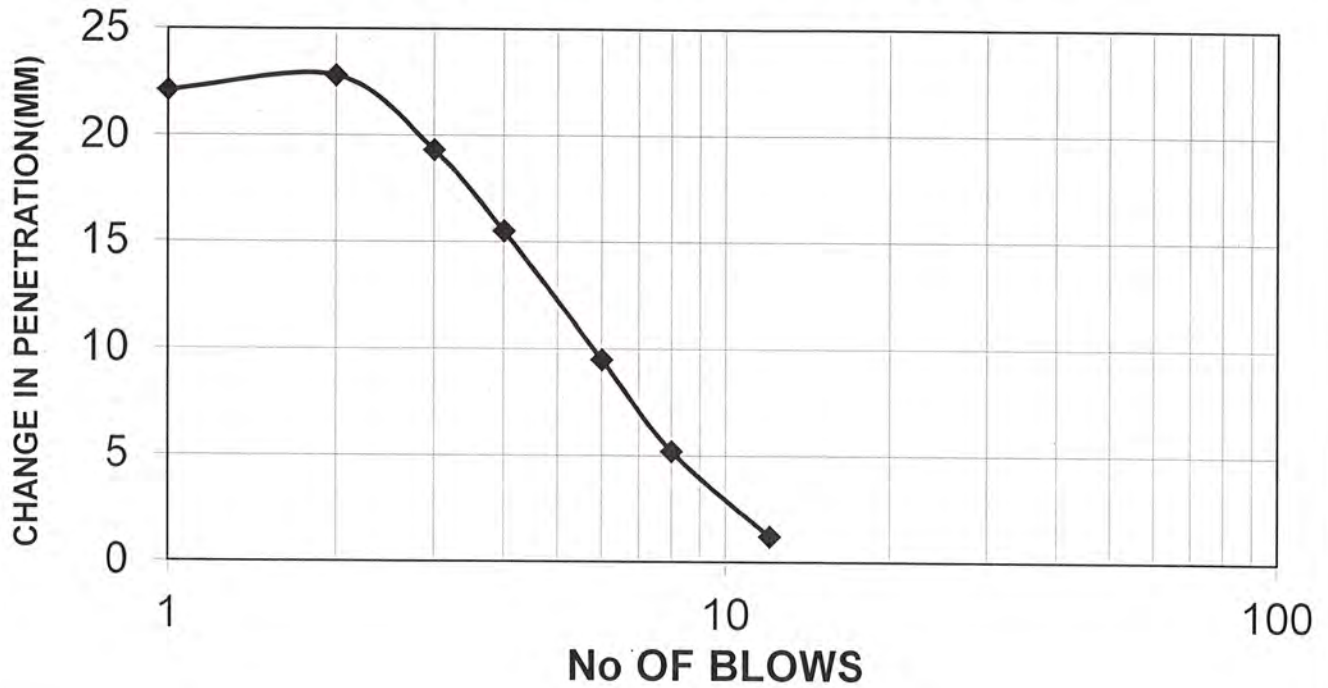
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC039 B7      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



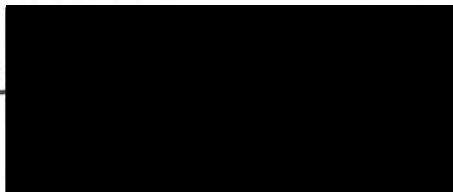
Sample	NAT
MCV	9.2
M.C.(%)	15
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 7.5% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



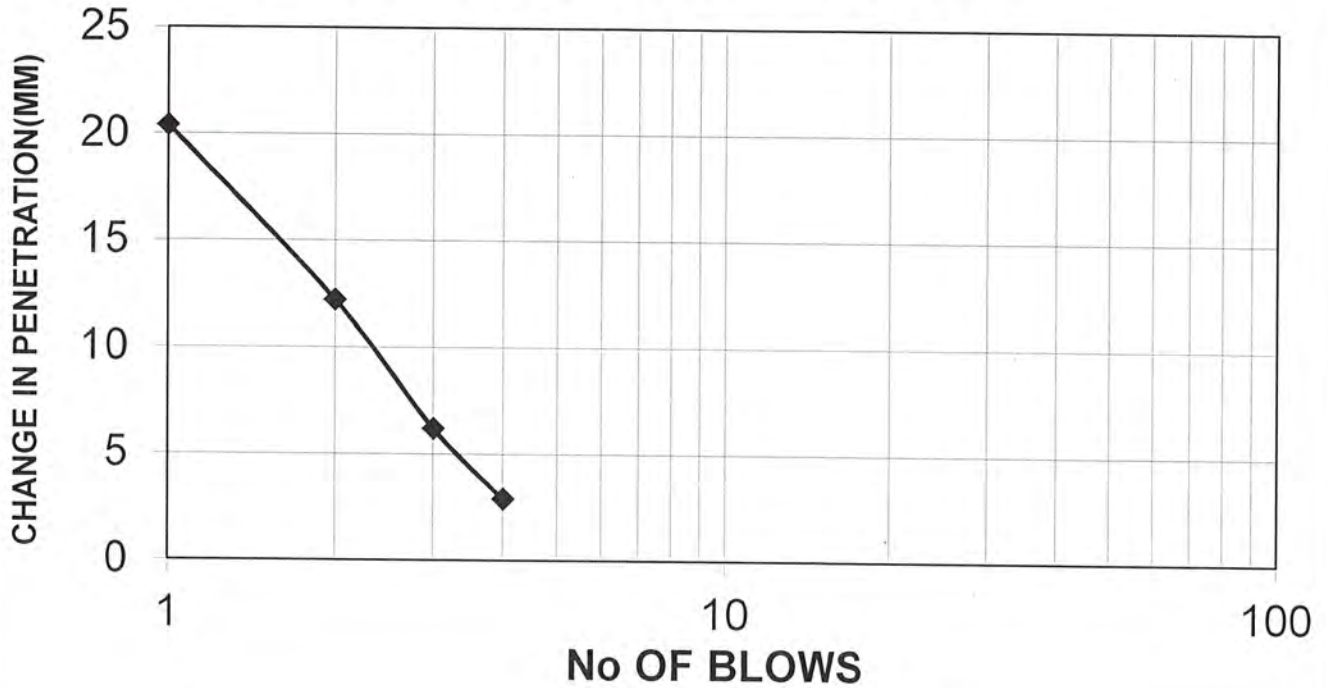
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC041A B1      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



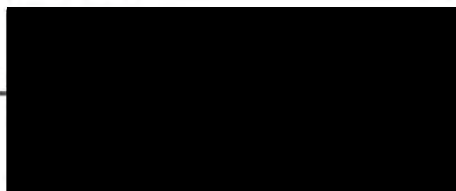
Sample	NAT
MCV	5.2
M.C.(%)	23
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>	

Remarks: 10.1% Retained on 20mm sieve

DATE TESTED: 27/05/2021

DATE OF ISSUE: 28/05/2021

APPROVED BY:



NAME: Michelle Selkirk



## Determination of MCV/Moisture Relationship



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367



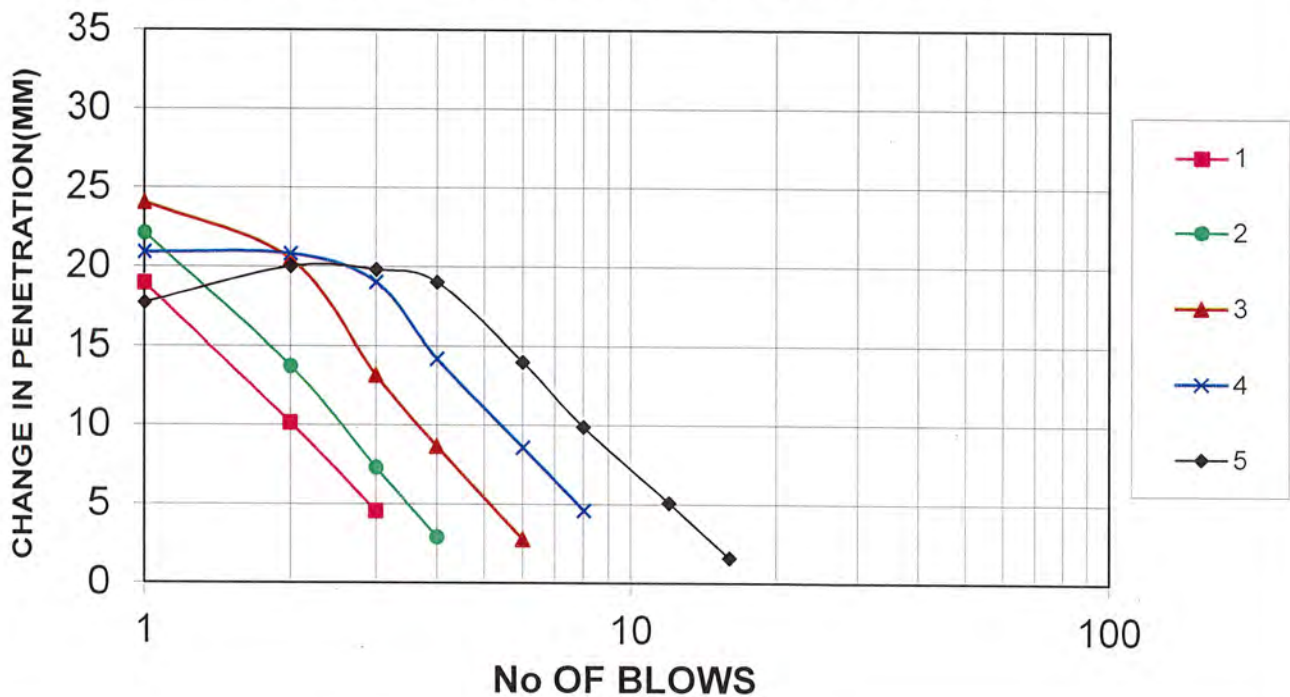
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.00m  
**Sample No:** BH SBC005 B3      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1 (NAT)	2	3	4	5
MCV	4.7	5.4	7.2	8.8	10.8
M.C.(%)	27	24	22	20	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 14.1% Retained on 20mm sieve.

DATE TESTED: 06/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk





## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
Chester-le-Street , Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

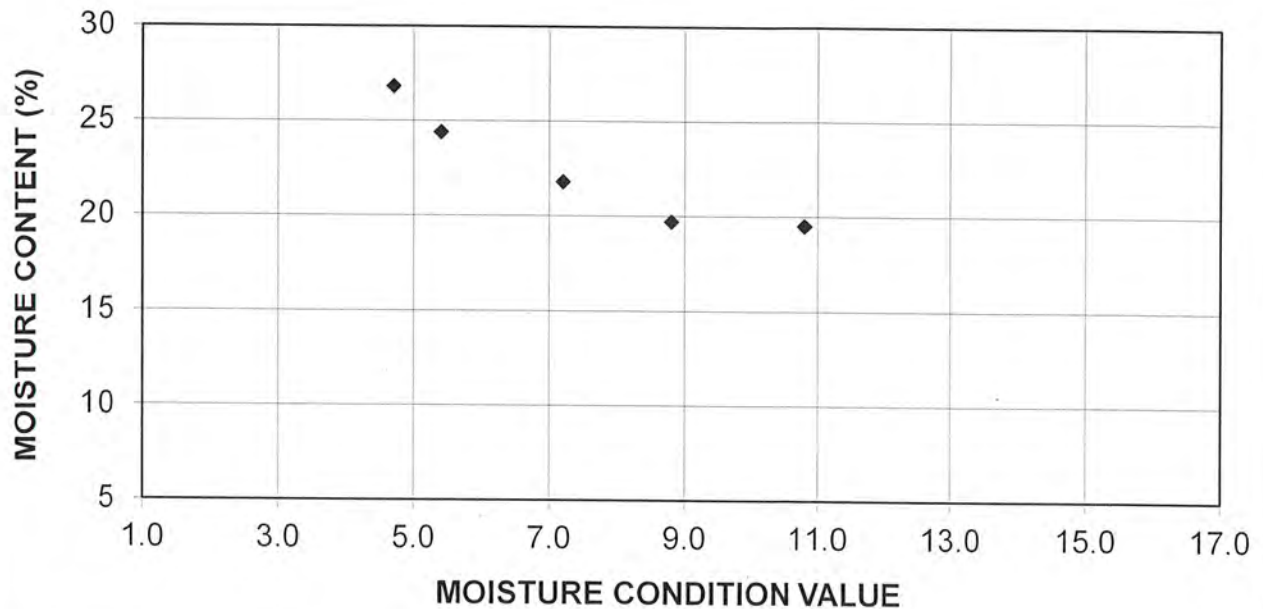


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	0.00m
<b>Sample No:</b>	BH SBC005 B3	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1 (NAT)	2	3	4	5
MCV	4.7	5.4	7.2	8.8	10.8
M.C.(%)	27	24	22	20	20
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>		31.17		<b>REMARKS:</b>	
<b>SLOPE</b>		-1.183			
<b>SENSITIVITY (1/SLOPE)</b>		-0.845			

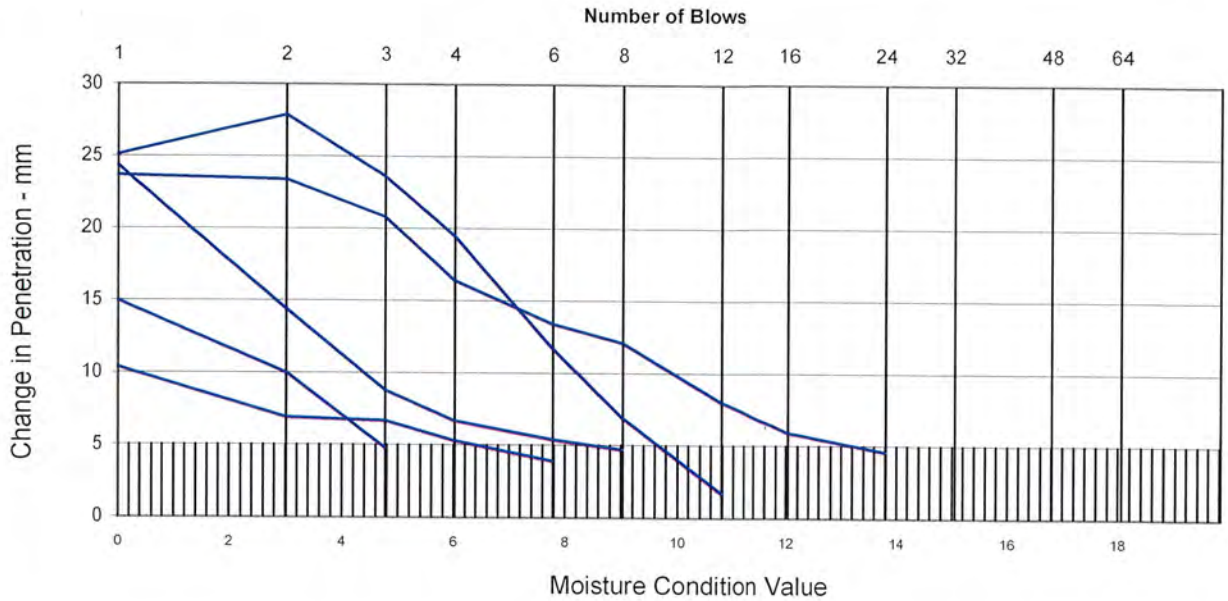


SITE INVESTIGATION AND LABORATORY SERVICES

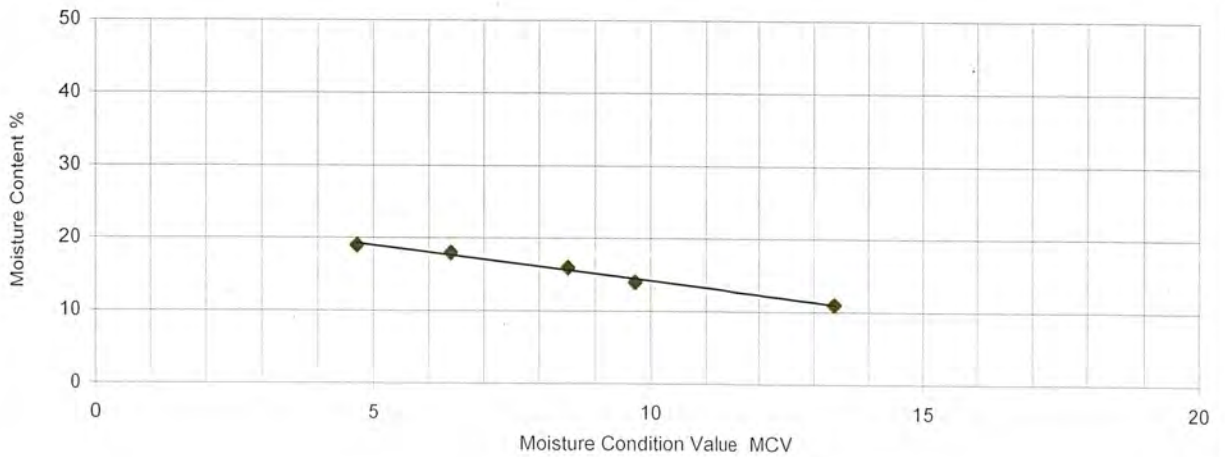
Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**

Exp. Point BH SBC013  
 Sample Ref  
 Depth (m) 8.50  
 Sample Type B28



Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse				
Determination No	1	2	3	4	5
Moisture Condition Value	9.7	8.5	13.4	4.7	6.4
Moisture Content	% 14	16	11	19	18
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line
Mass retained on 20mm sieve	% 0.5				



Intercept	%	23.8
Slope		-0.96
Sensitivity		-1.05

Originator	Checked & Approved
SM	[Redacted Signature]
	01/06/2021

**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5





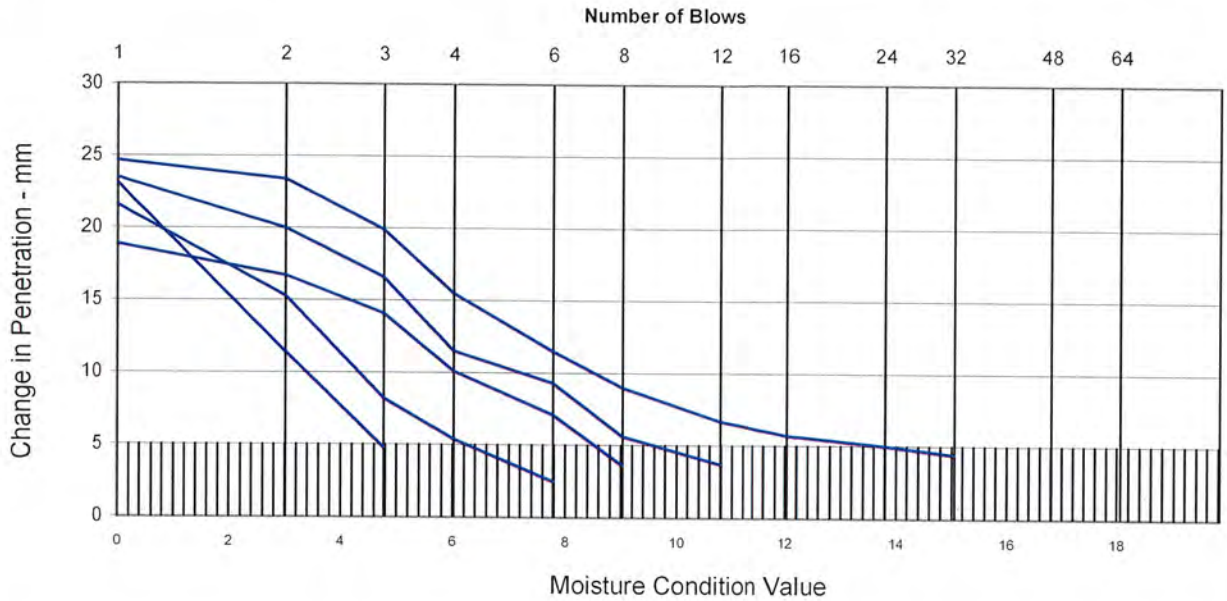


SITE INVESTIGATION AND LABORATORY SERVICES

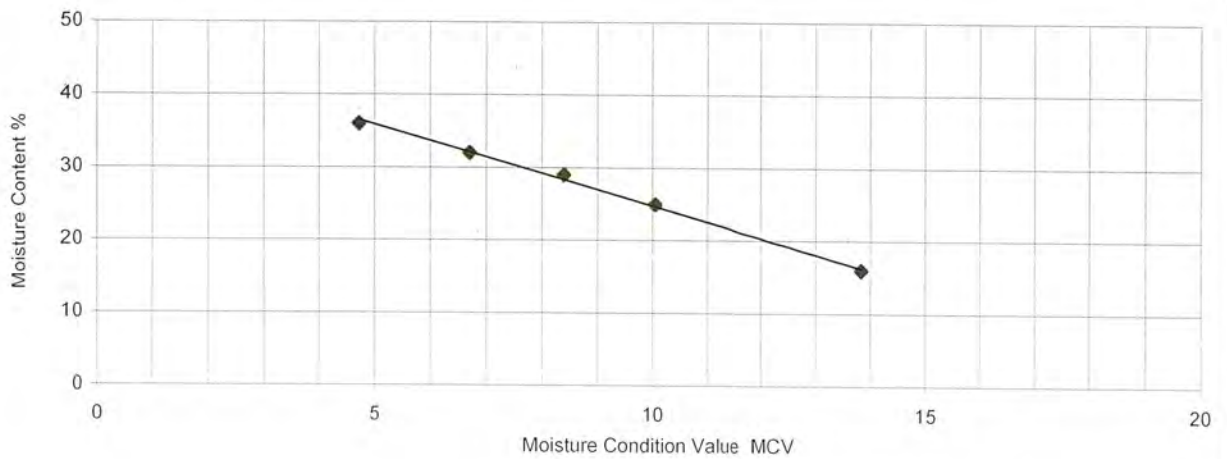
Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**


Exp. Point BH SBC021  
 Sample Ref  
 Depth (m) 0.05  
 Sample Type B2



Non Engineering Description	Brown clayey very garvelly very sandy SILT. Gravel is fine to coarse					
Determination No	1	2	3	4	5	
Moisture Condition Value	4.7	13.8	10.0	8.4	6.7	
Moisture Content	%	36	16	25	29	32
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line	
Mass retained on 20mm sieve	%	1.1				



Intercept	%	47.0
Slope		-2.22
Sensitivity		-0.45

Originator	Checked & Approved
SM	 01/06/2021

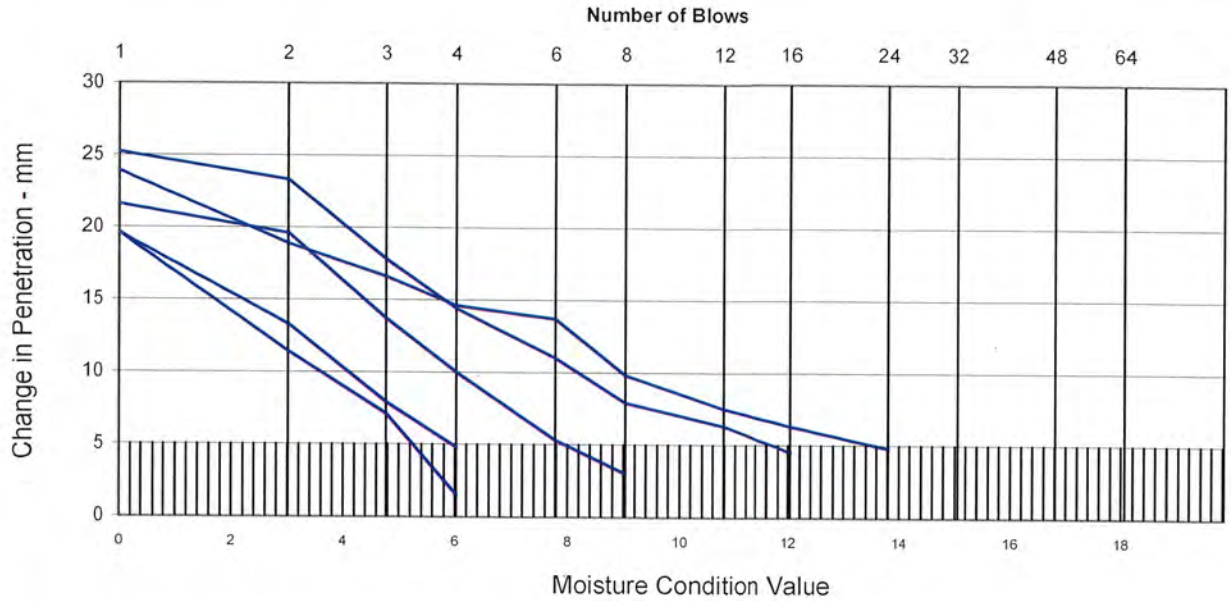
**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5



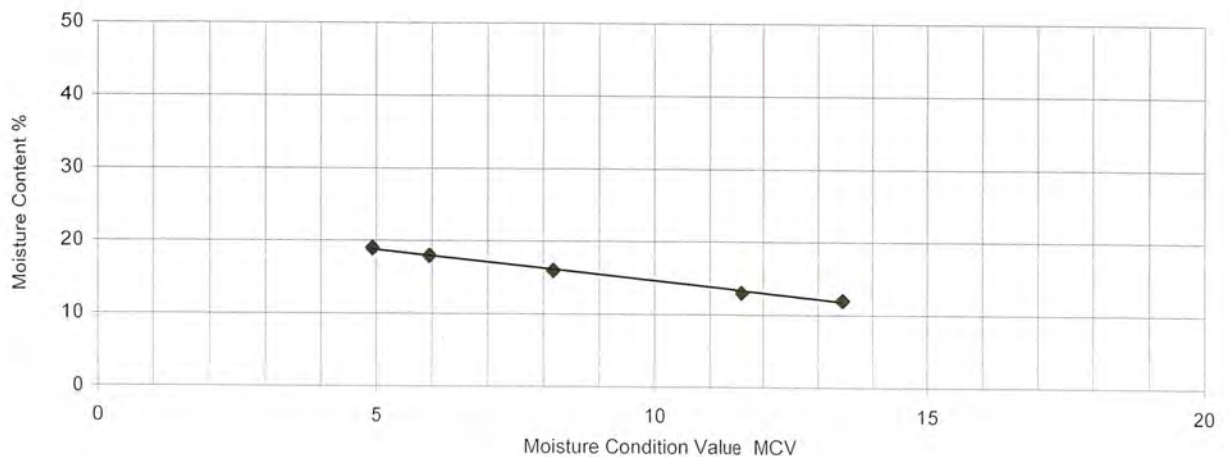


Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**  
 Exp. Point BH SBC024  
 Sample Ref  
 Depth (m) 4.50  
 Sample Type B17



Non Engineering Description	Brown clayey garvelly very sandy SILT. Gravel is fine to coarse				
Determination No	1	2	3	4	5
Moisture Condition Value	8.2	11.6	13.4	6.0	4.9
Moisture Content	% 16	13	12	18	19
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line
Mass retained on 20mm sieve	% 9.7				



Intercept	%	22.9
Slope		-0.82
Sensitivity		-1.22

Originator	Checked & Approved
SM	 01/06/2021

**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5

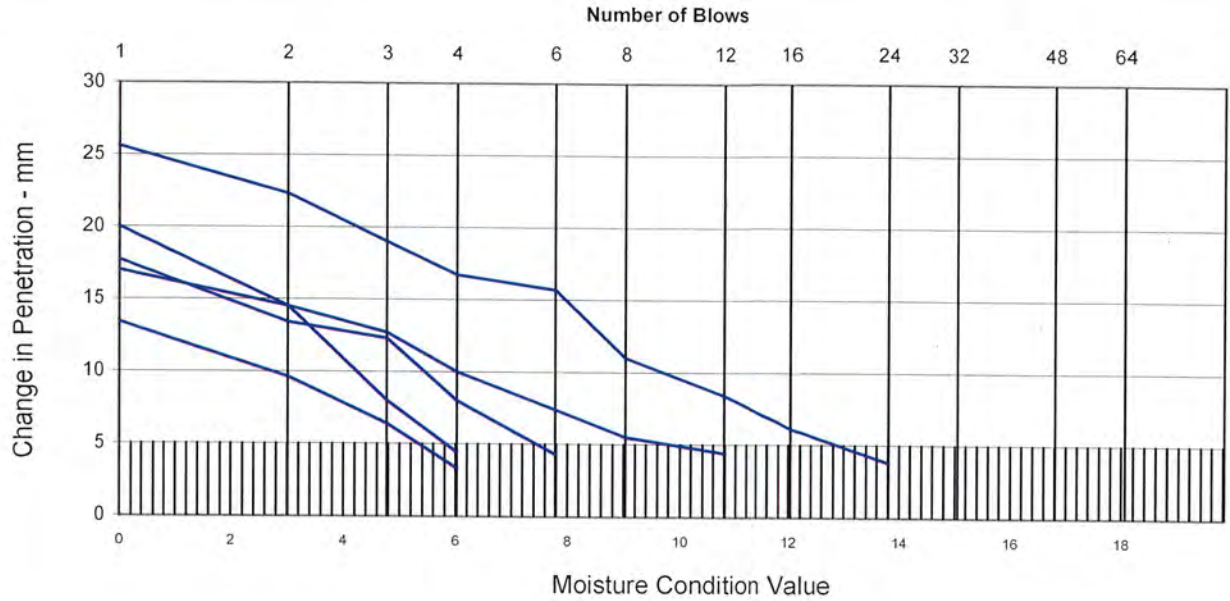




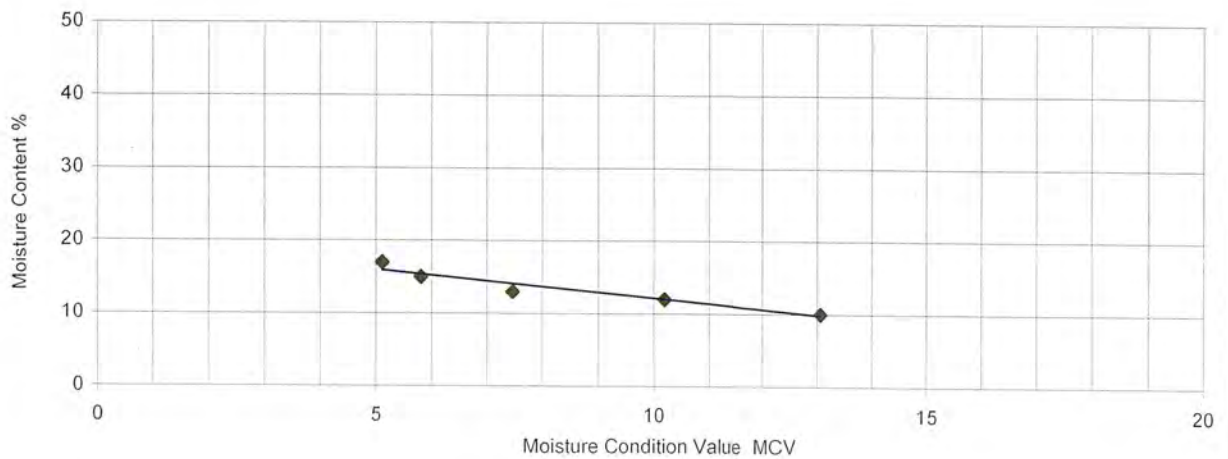


Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**  
 Exp. Point BH SBC026  
 Sample Ref  
 Depth (m) 2.30  
 Sample Type B12



Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse				
Determination No	1	2	3	4	5
Moisture Condition Value	13.1	7.5	10.2	5.1	5.8
Moisture Content	% 10.0	13	12	17	15
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line
Mass retained on 20mm sieve	% 18.5				



Intercept	%	19.8
Slope		-0.76
Sensitivity		-1.31

Originator	Checked & Approved
SM	 01/06/2021

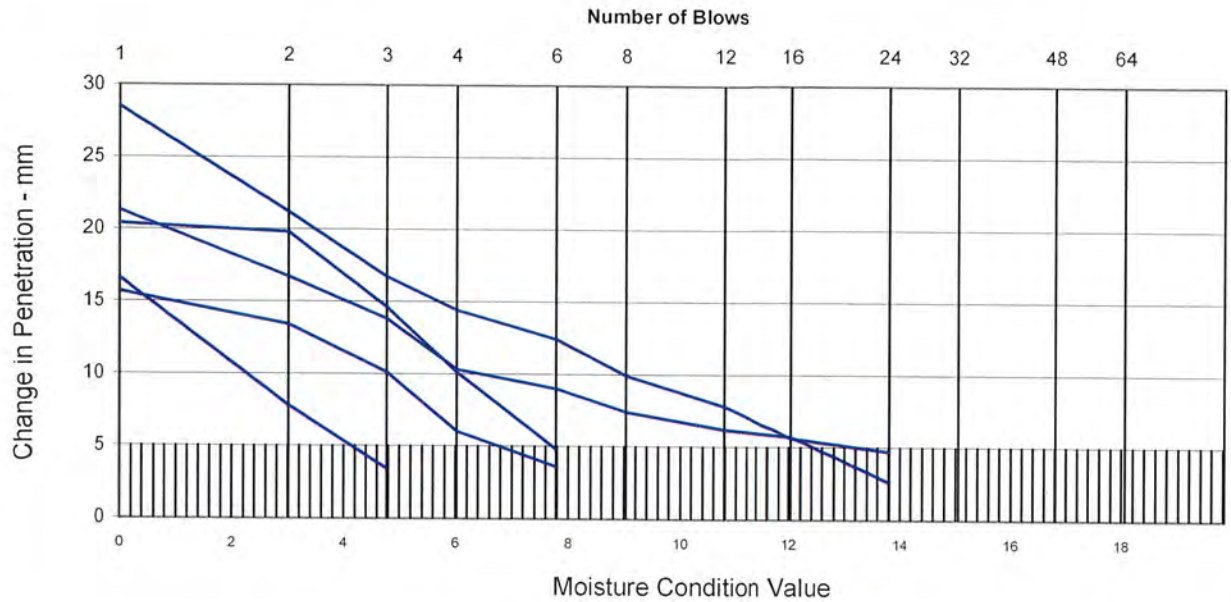
**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5



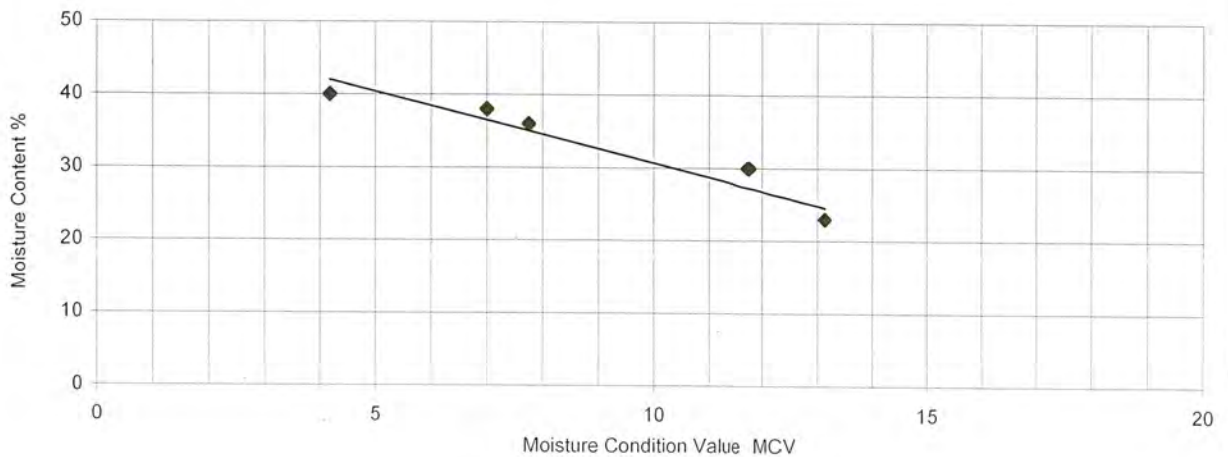


Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**  
 Exp. Point BH SBC027  
 Sample Ref  
 Depth (m) 0.05  
 Sample Type B2



Non Engineering Description	Brown clayey very garvelly very sandy SILT. Gravel is fine to coarse				
Determination No	1	2	3	4	5
Moisture Condition Value	7.7	11.8	13.1	7.0	4.2
Moisture Content	% 36	30	23	38	40
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line
Mass retained on 20mm sieve	% 3.8				



Intercept	%	50.1
Slope		-1.94
Sensitivity		-0.51

Originator	Checked & Approved
SM	 01/06/2021

**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5







**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC011 B9      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1	2	3	4 (NAT)	5
MCV	2.0	6.4	6.6	8.0	10.2
M.C.(%)	21	19	18	17	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 3.0% Retained on 20mm sieve.

DATE TESTED: 29/04/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

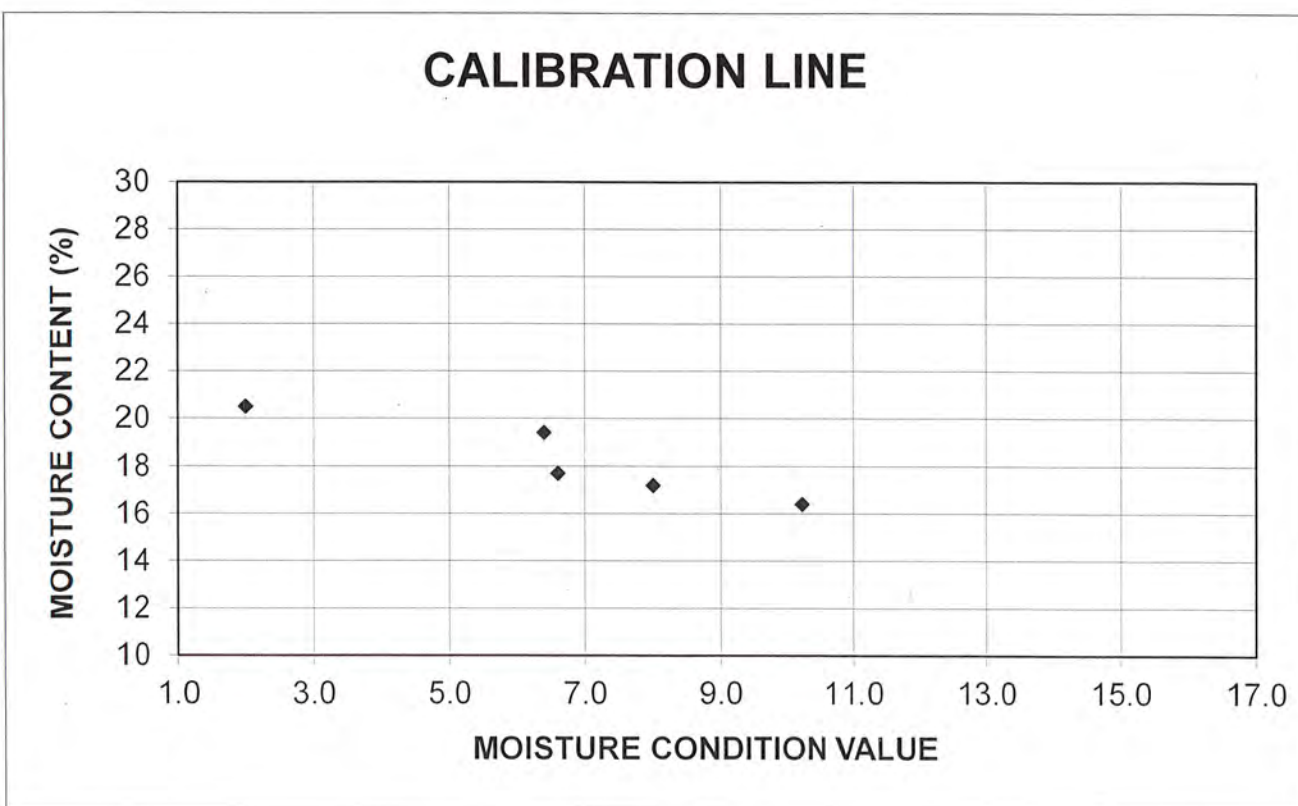
Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	2.00m
<b>Sample No:</b>	TP SBC011 B9	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**



Sample	1	2	3	4 (NAT)	5
MCV	2.0	6.4	6.6	8.0	10.2
M.C.(%)	21	19	18	17	16
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
INTERCEPT (MC% AXIS)			21.68	REMARKS:	
SLOPE			-0.518		
SENSITIVITY (1/SLOPE)			-1.930		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.00m  
**Sample No:** TP SBC012A B13      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1	2	3 (NAT)	4	5
MCV	1.9	5.8	9.8	12.4	14.7
M.C.(%)	19	16	15	13	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 3.7% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

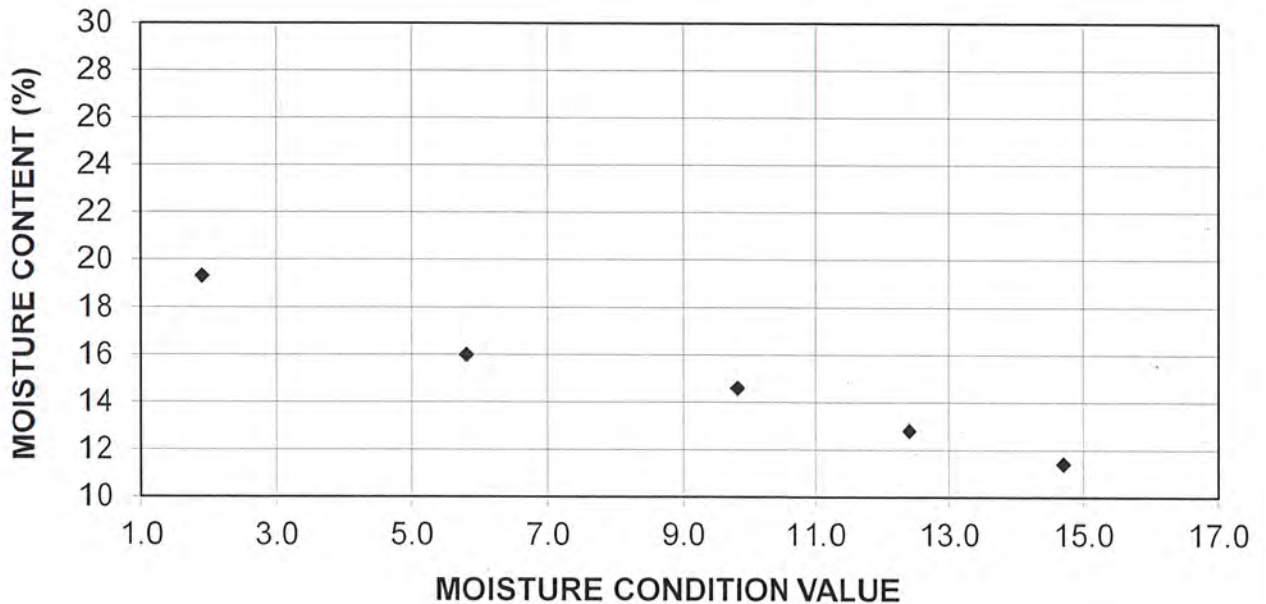


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	4.00m
<b>Sample No:</b>	TP SBC012A B13	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

**CALIBRATION LINE**



Sample	1	2	3 (NAT)	4	5
MCV	1.9	5.8	9.8	12.4	14.7
M.C.(%)	19	16	15	13	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			20.08	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.590		
<b>SENSITIVITY (1/SLOPE)</b>			-1.695		





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**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

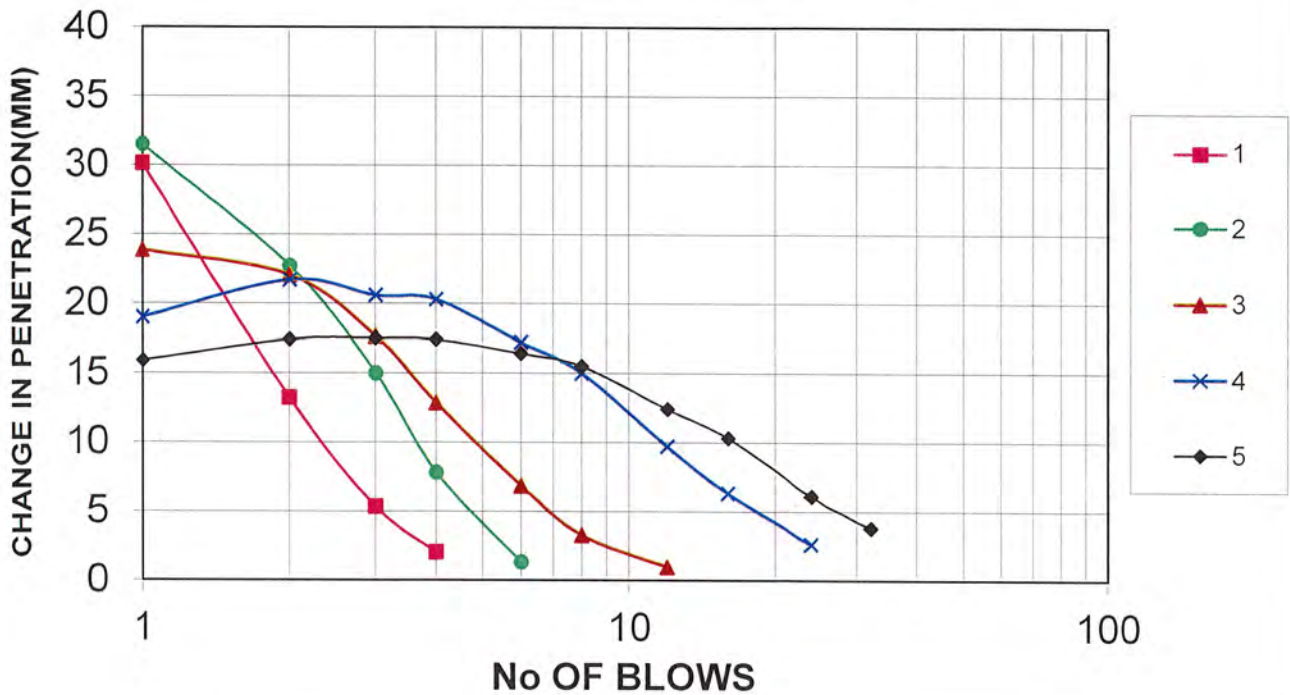


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A.  
**CLIENT:** AMEY OW Limited      **Depth:** 4.00m  
**Sample No:** TP SBC013 B12      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1	2	3 (NAT)	4	5
MCV	5.2	6.8	8.4	12.6	14.4
M.C.(%)	16	15	13	11	10
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 7.5% Retained on 20mm sieve.

DATE TESTED: 10/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

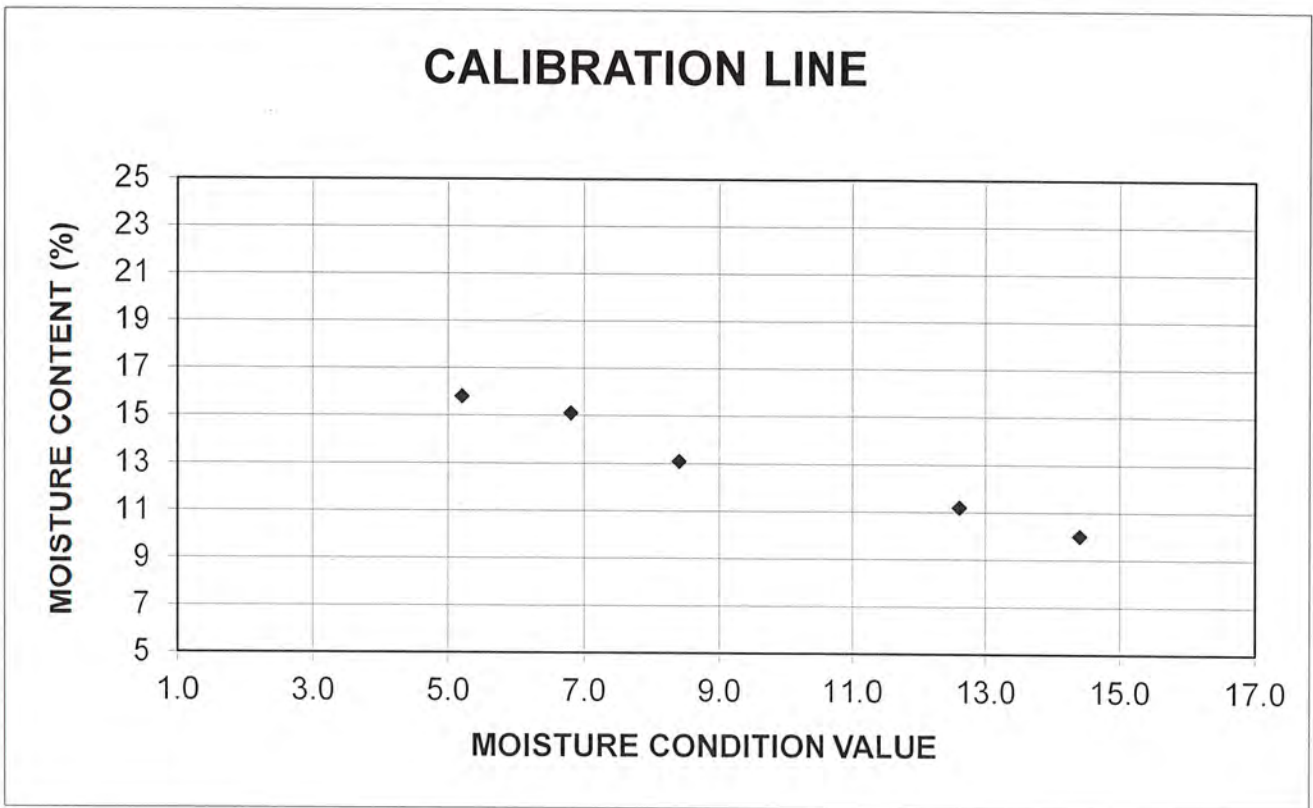
**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.00m  
**Sample No:** TP SBC013 B12      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**



Sample	1	2	3 (NAT)	4	5
MCV	5.2	6.8	8.4	12.6	14.4
M.C.(%)	16	15	13	11	10
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			19.00	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.629		
<b>SENSITIVITY (1/SLOPE)</b>			-1.591		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell

Chester-le-Street , Co Durham DH2 2RG

a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9

**JOB No:** 4322A

**CLIENT:** AMEY OW Limited

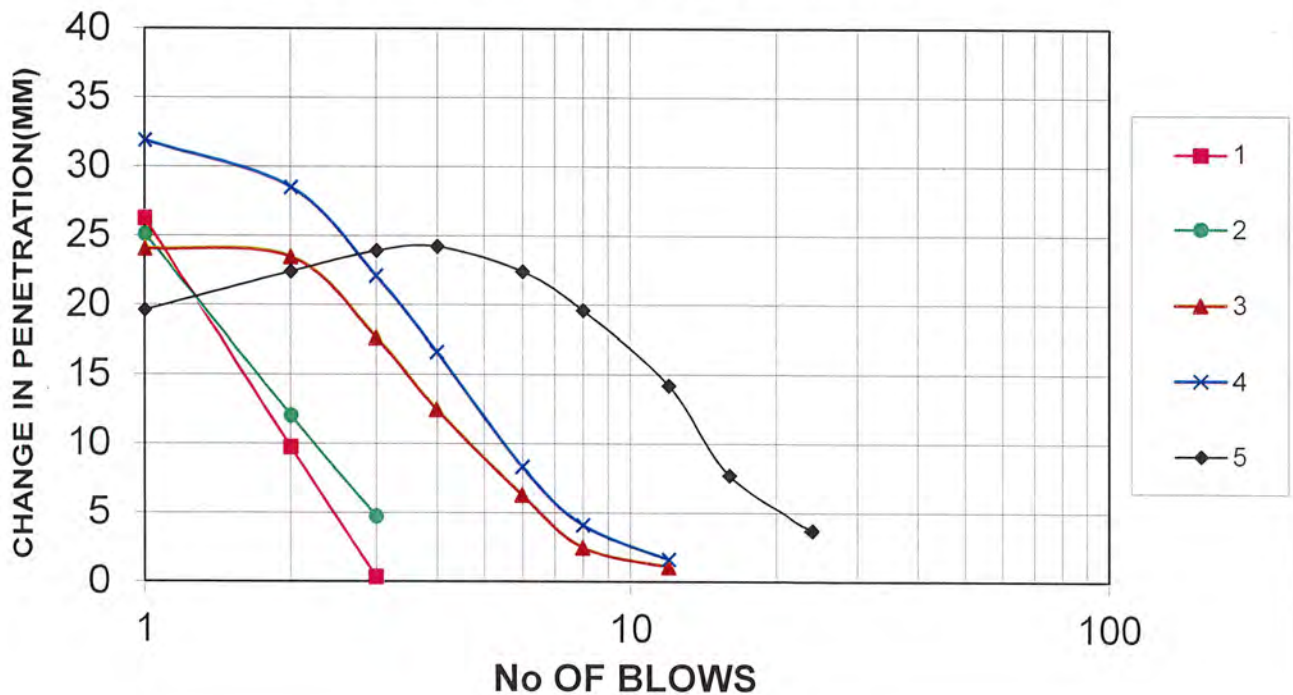
**Depth:** 2.80m

**Sample No:** TP SBC014 B14

**Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1	2	3 (NAT)	4	5
MCV	4.2	4.8	8.2	9.0	13.2
M.C.(%)	21	21	18	17	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 7.8% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

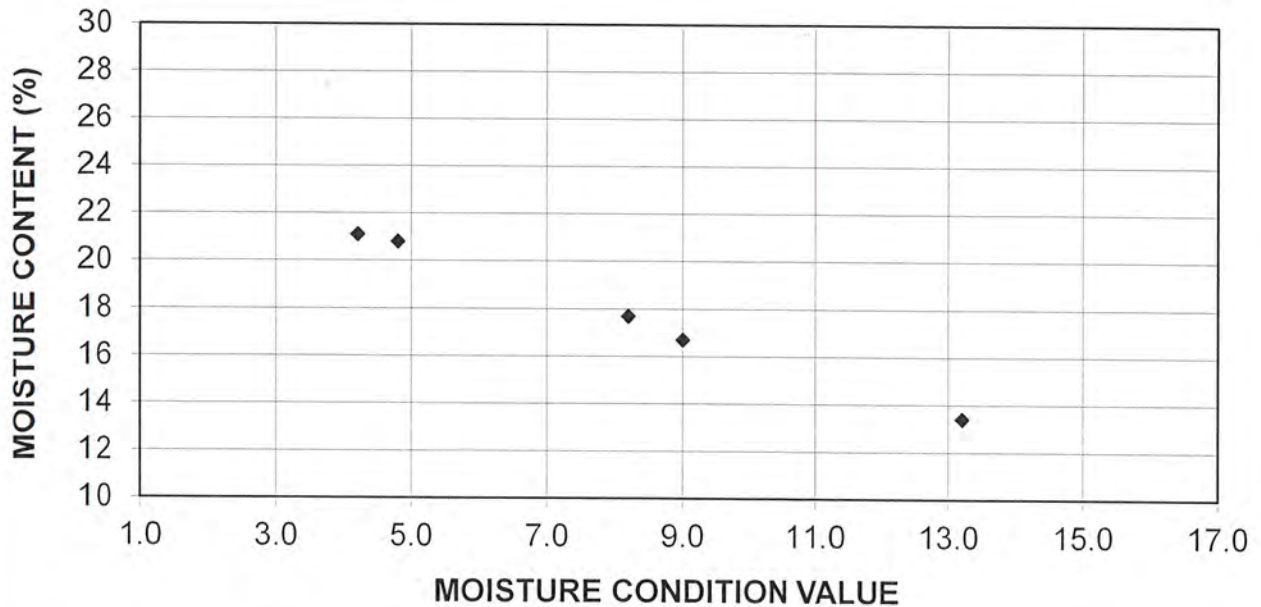


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	2.80m
<b>Sample No:</b>	TP SBC014 B14	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2	3 (NAT)	4	5
MCV	4.2	4.8	8.2	9.0	13.2
M.C.(%)	21	21	18	17	13
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			24.83	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.874		
<b>SENSITIVITY (1/SLOPE)</b>			-1.144		





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Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC017 B10      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



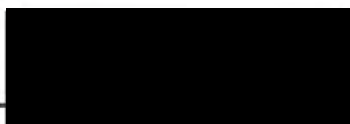
Sample	1	2	3 (NAT)	4	5
MCV	4.0	8.4	9.1	12.4	13.4
M.C.(%)	19	18	14	12	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 7.9% Retained on 20mm sieve.

DATE TESTED: 10/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
Chester-le-Street , Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

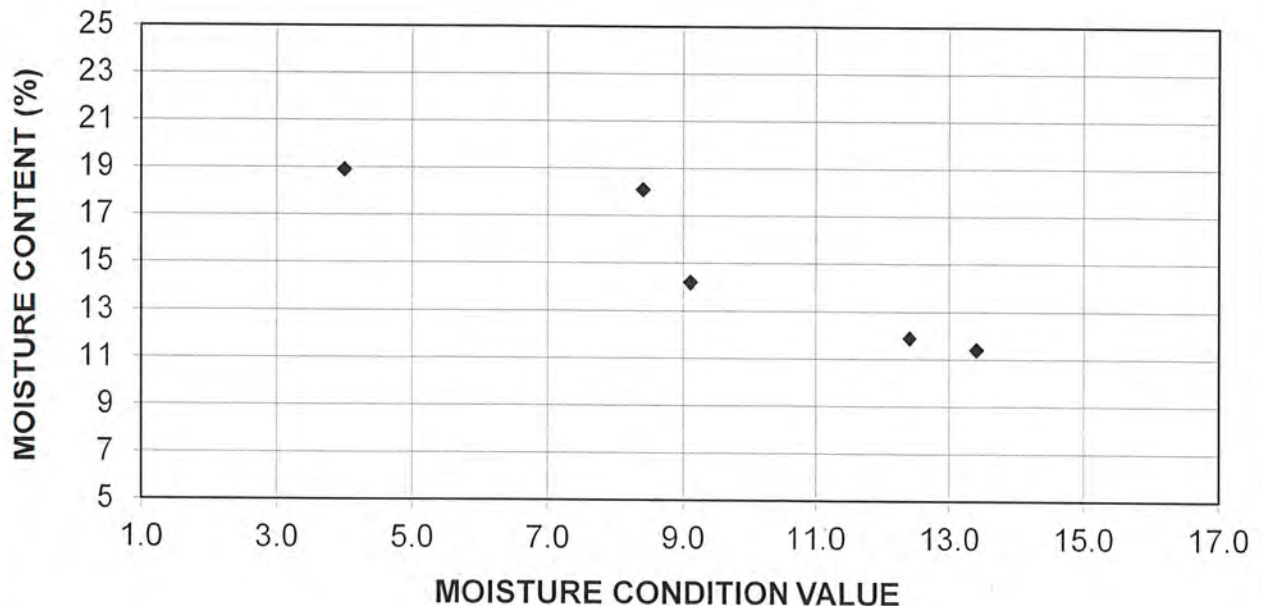


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 2.00m  
**Sample No:** TP SBC017 B10      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2	3 (NAT)	4	5
MCV	4.0	8.4	9.1	12.4	13.4
M.C.(%)	19	18	14	12	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
INTERCEPT (MC% AXIS)			23.05	REMARKS:	
SLOPE			-0.862		
SENSITIVITY (1/SLOPE)			-1.161		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

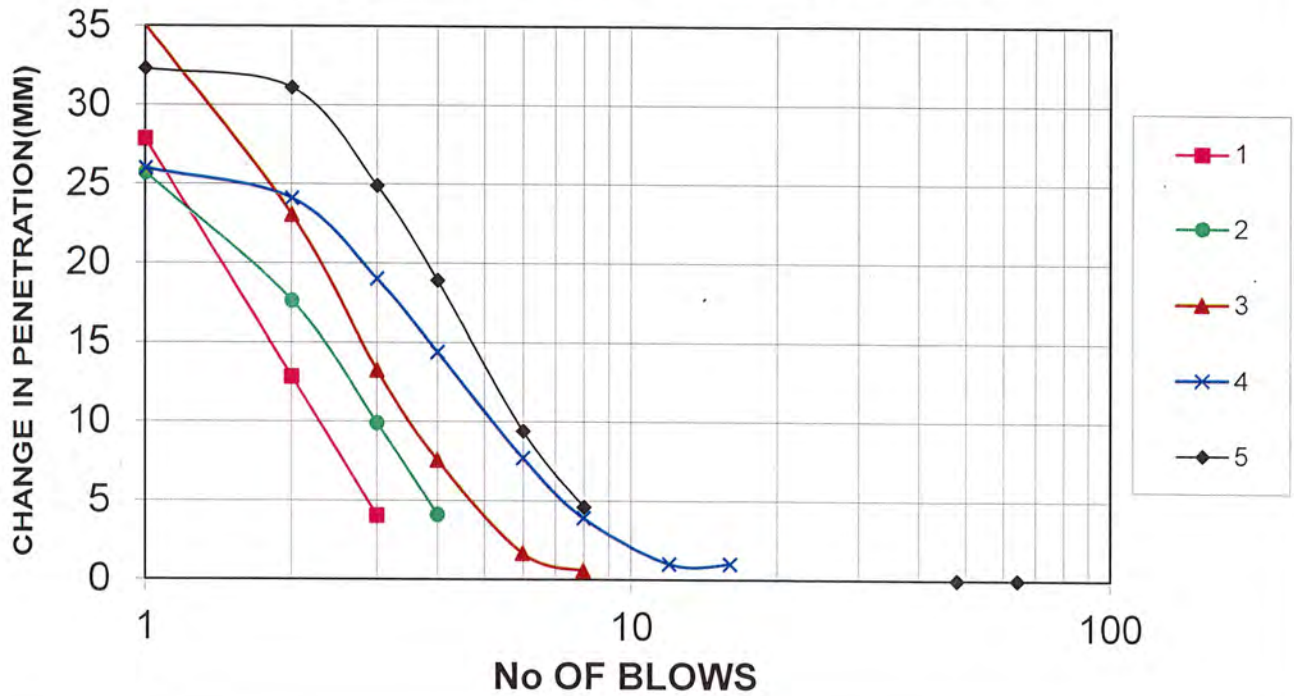


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC021 B6      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



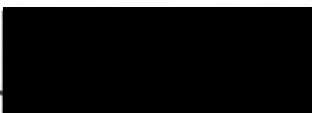
Sample	1	2	3	4 (NAT)	5
MCV	4.6	5.8	6.8	8.6	9.0
M.C.(%)	25	24	22	22	21
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 7.4% Retained on 20mm sieve.

DATE TESTED: 10/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
Chester-le-Street , Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

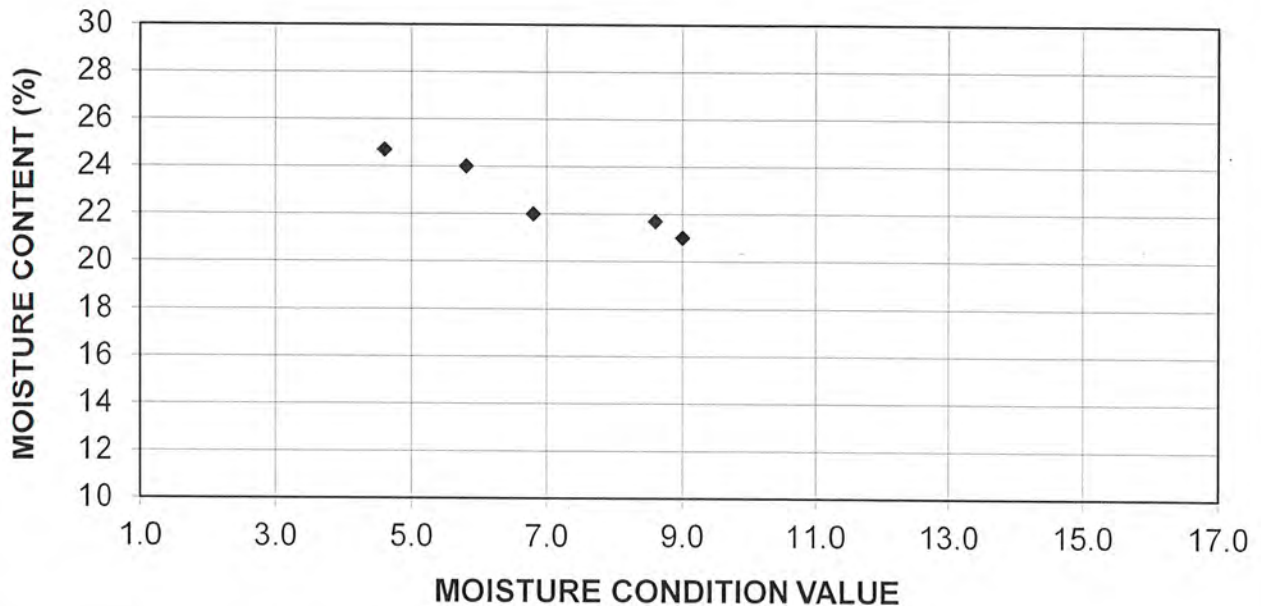


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	1.00m
<b>Sample No:</b>	TP SBC021 B6	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2	3	4 (NAT)	5
MCV	4.6	5.8	6.8	8.6	9
M.C.(%)	25	24	22	22	21
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			28.34	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.814		
<b>SENSITIVITY (1/SLOPE)</b>			-1.229		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	3.00m
<b>Sample No:</b>	TP SBC022 B10	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



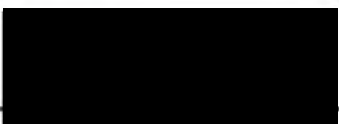
Sample	1	2	3 (NAT)	4	5
MCV	5.0	5.6	7.0	8.2	11.2
M.C.(%)	15	14	13	13	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

**Remarks:** 11.1% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No. 1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

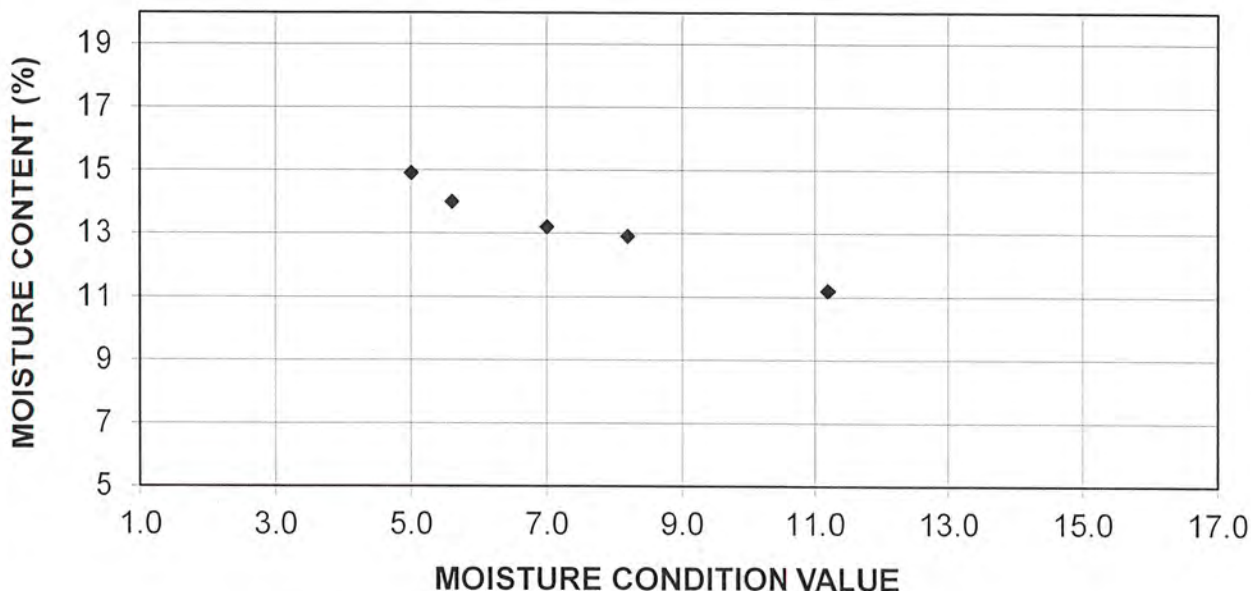


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	3.00m
<b>Sample No:</b>	TP SBC022 B10	<b>Specific Depth:</b>	N/A

For sample description please refer to sample description sheet.

**CALIBRATION LINE**



Sample	1	2	3 (NAT)	4	5
MCV	5.0	5.6	7.0	8.2	11.2
M.C.(%)	15	14	13	13	11
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			17.32	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.551		
<b>SENSITIVITY (1/SLOPE)</b>			-1.814		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**



No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC026 B5      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



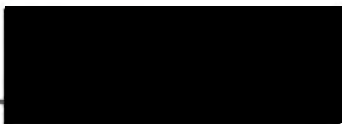
Sample	1	2 (NAT)	3	4	5
MCV	4.8	7.7	10.8	12.2	12.8
M.C.(%)	21	19	16	15	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 5.4% Retained on 20mm sieve.

DATE TESTED: 06/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
Chester-le-Street , Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

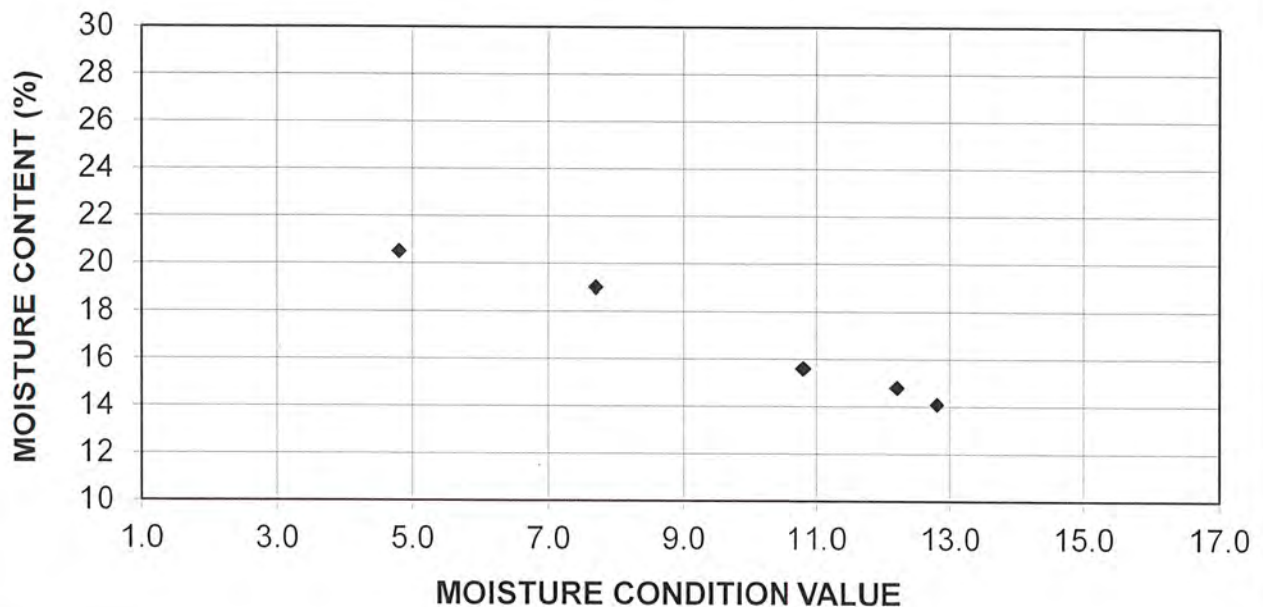


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	1.00m
<b>Sample No:</b>	TP SBC026 B5	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2 (NAT)	3	4	5
MCV	4.8	7.7	10.8	12.2	12.8
M.C.(%)	21	19	16	15	14
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			24.78	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.826		
<b>SENSITIVITY (1/SLOPE)</b>			-1.211		





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

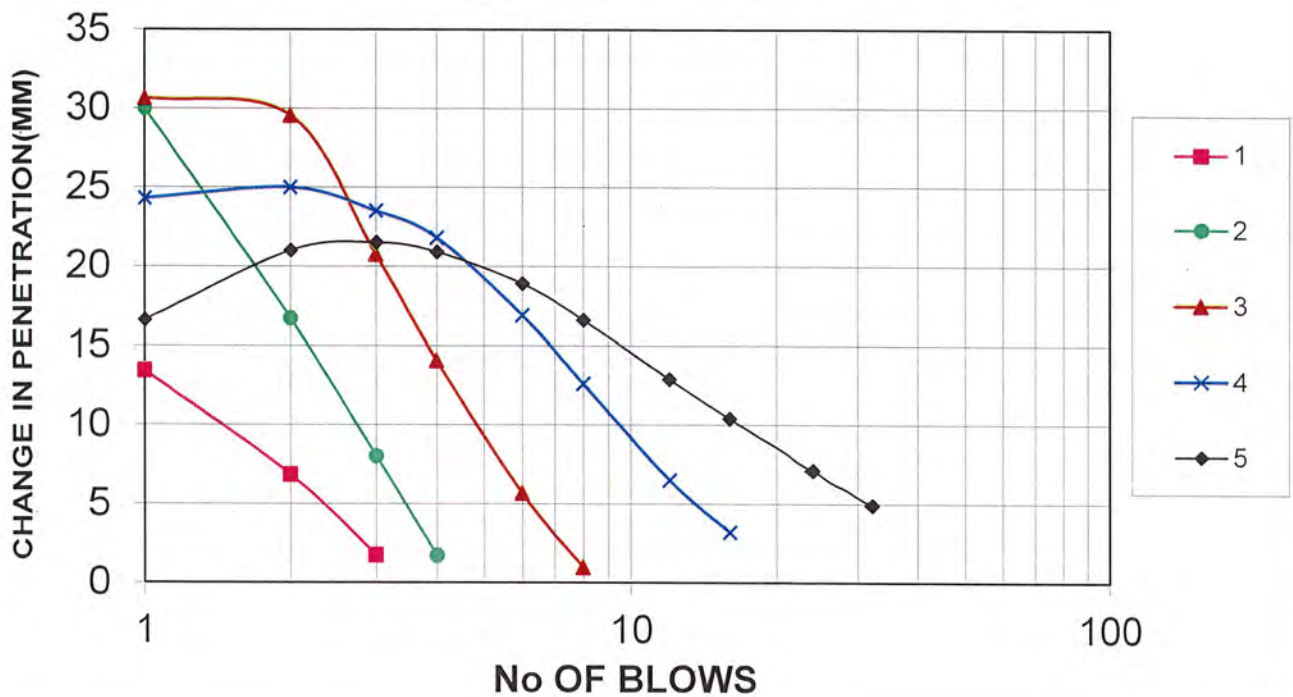


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.80m  
**Sample No:** TP SBC028 B19      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

**CHANGE IN PENETRATION PLOT**



Sample	1	2	3	4 (NAT)	5
MCV	3.6	5.4	8.0	11.3	14.9
M.C.(%)	16	15	14	12	10
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 7.3% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk



## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

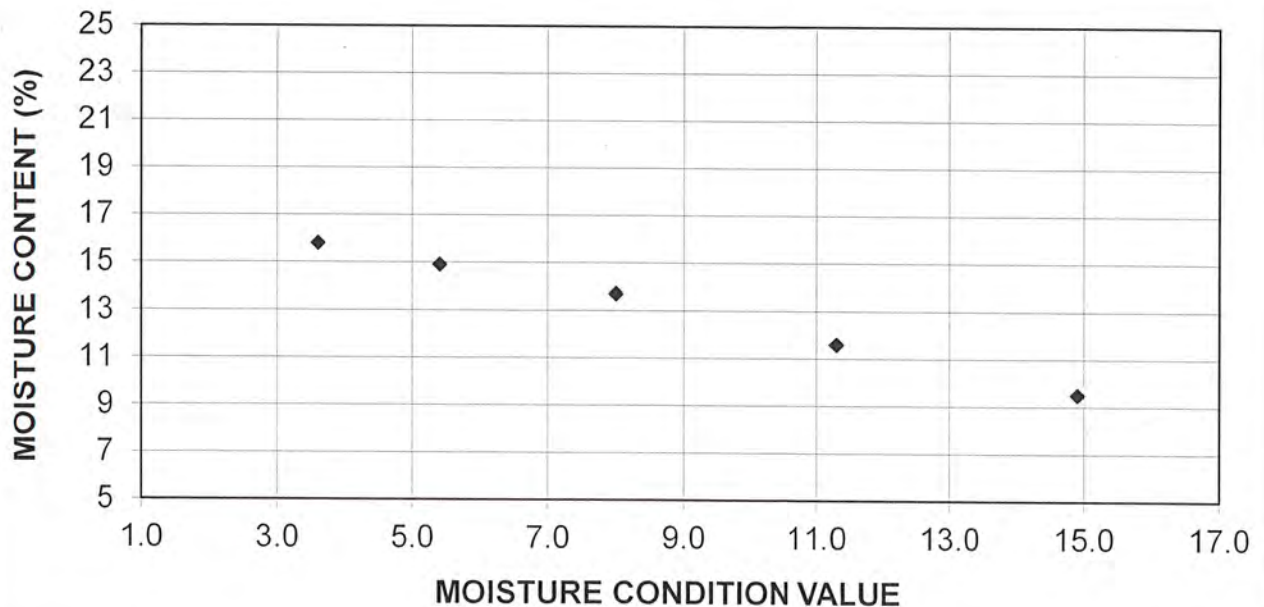


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 4.80m  
**Sample No:** TP SBC028 B19      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2	3	4 (NAT)	5
MCV	3.6	5.4	8	11.3	14.9
M.C.(%)	16	15	14	12	10
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			17.95	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.561		
<b>SENSITIVITY (1/SLOPE)</b>			-1.781		



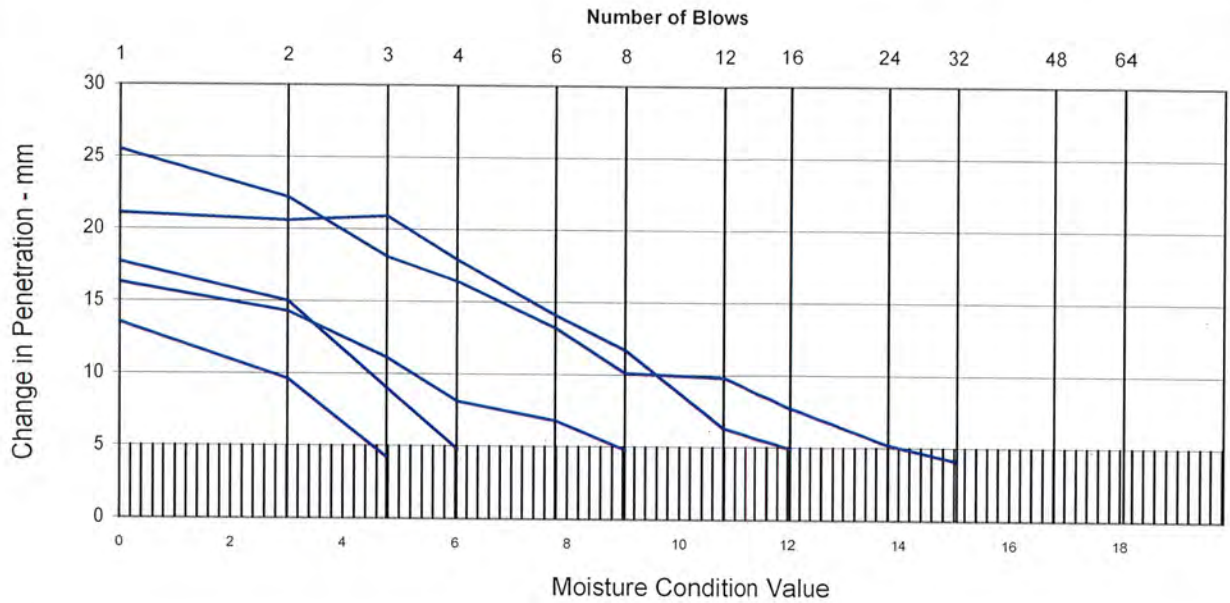


SITE INVESTIGATION AND LABORATORY SERVICES

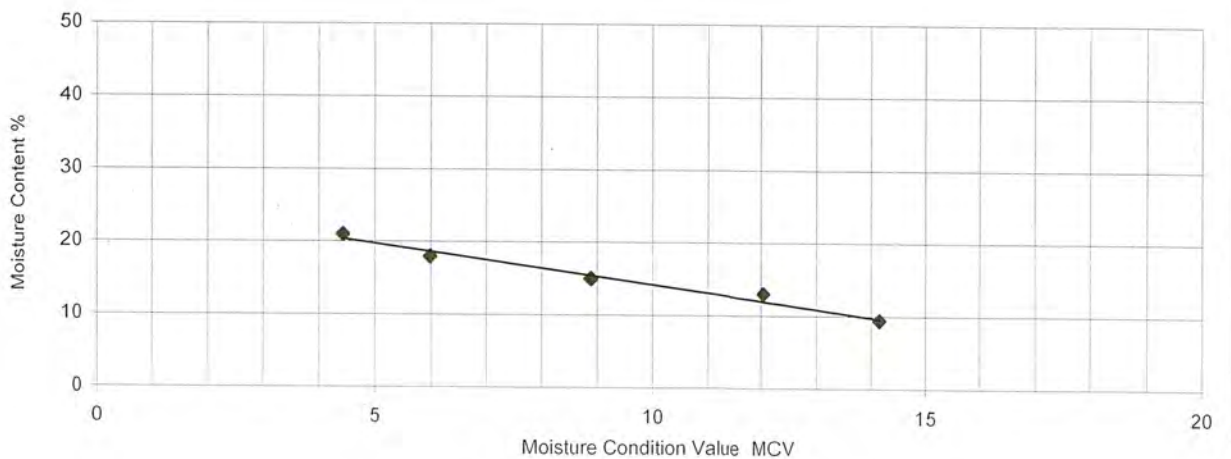
Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9  
 Client Allied Exploration & Geotechnics Limited  
 Engineer

Contract No **A13955**

Exp. Point TP SBC030  
 Sample Ref  
 Depth (m) 2.00  
 Sample Type B10



Non Engineering Description	Brown gravelly very sandy silty CLAY. Gravel is fine to coarse				
Determination No	1	2	3	4	5
Moisture Condition Value	12.0	14.2	8.9	4.4	6.0
Moisture Content	% 13	9.4	15	21	18
Method of determining MCV	Best-fit line	Best-fit line	Best-fit line	Best-fit line	Best-fit line
Mass retained on 20mm sieve	% 2.1				



Intercept	%	25.3
Slope		-1.11
Sensitivity		-0.90

Originator	Checked & Approved
SM	
	07/06/2021

**MOISTURE CONDITION VALUE**  
 BS1377:Part 4:1990 Clause 5.5





**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
 Chester-le-Street , Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

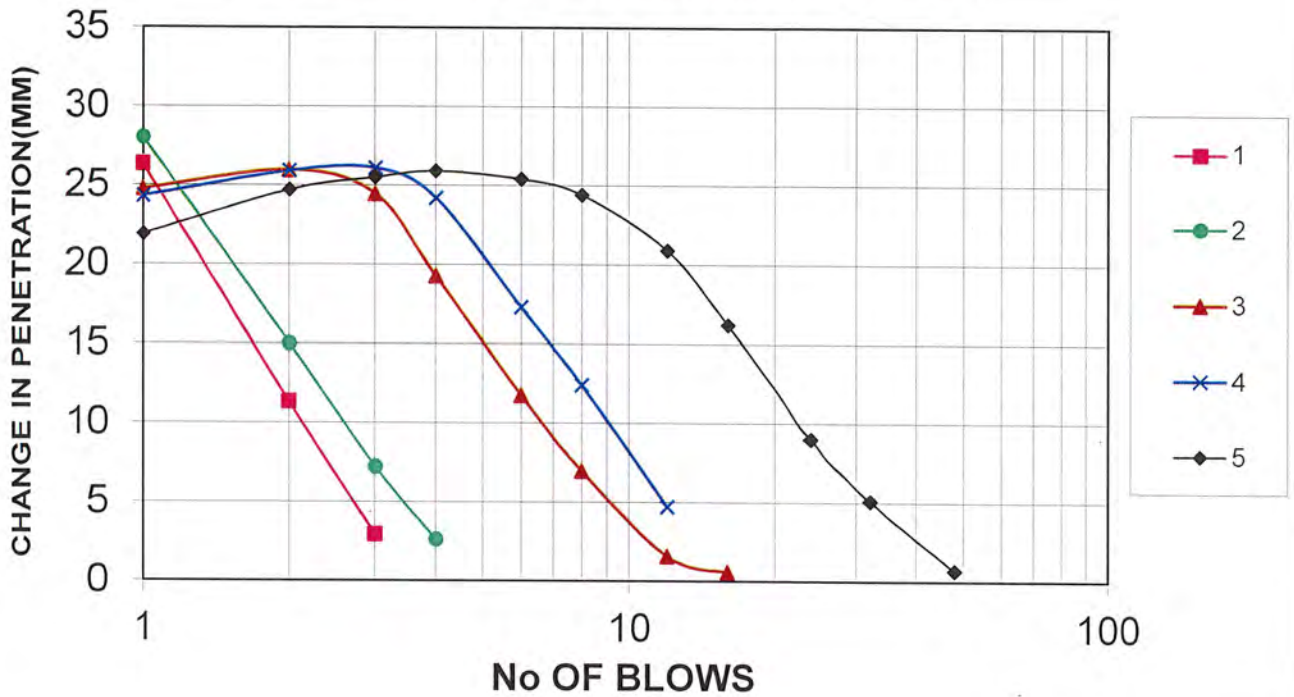


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 0.80m  
**Sample No:** TP SBC031 B6      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



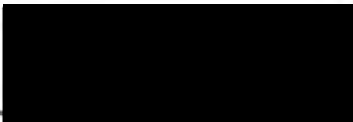
Sample	1	2	3 (NAT)	4	5
MCV	4.6	5.4	9.7	10.6	15.0
M.C.(%)	24	23	20	18	15
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 9.4% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk





## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate , Pelton Fell  
Chester-le-Street , Co Durham DH2 2RG  
a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

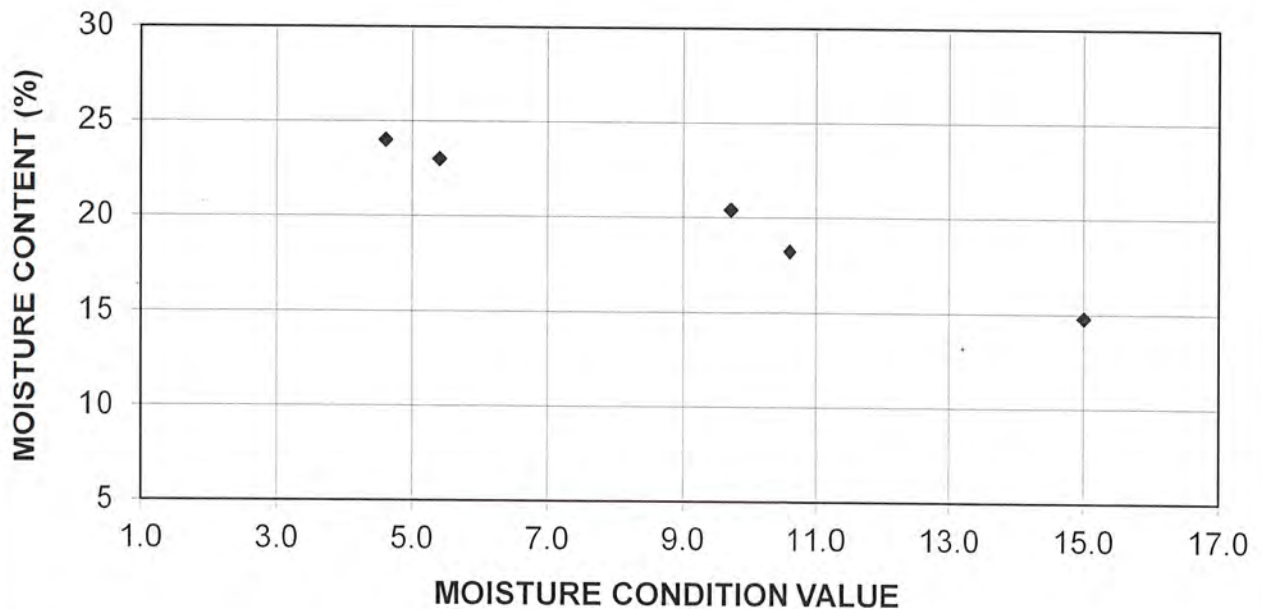


No. 1367

<b>SITE:</b>	A66 North Trans Pennine Scheme C Section 9	<b>JOB No:</b>	4322A
<b>CLIENT:</b>	AMEY OW Limited	<b>Depth:</b>	0.80m
<b>Sample No:</b>	TP SBC031 B6	<b>Specific Depth:</b>	N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2	3 (NAT)	4	5
MCV	4.6	5.4	9.7	10.6	15.0
M.C.(%)	24	23	20	18	15
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			27.98	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.872		
<b>SENSITIVITY (1/SLOPE)</b>			-1.147		



**ALLIED EXPLORATION & GEOTECHNICS LIMITED**

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 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

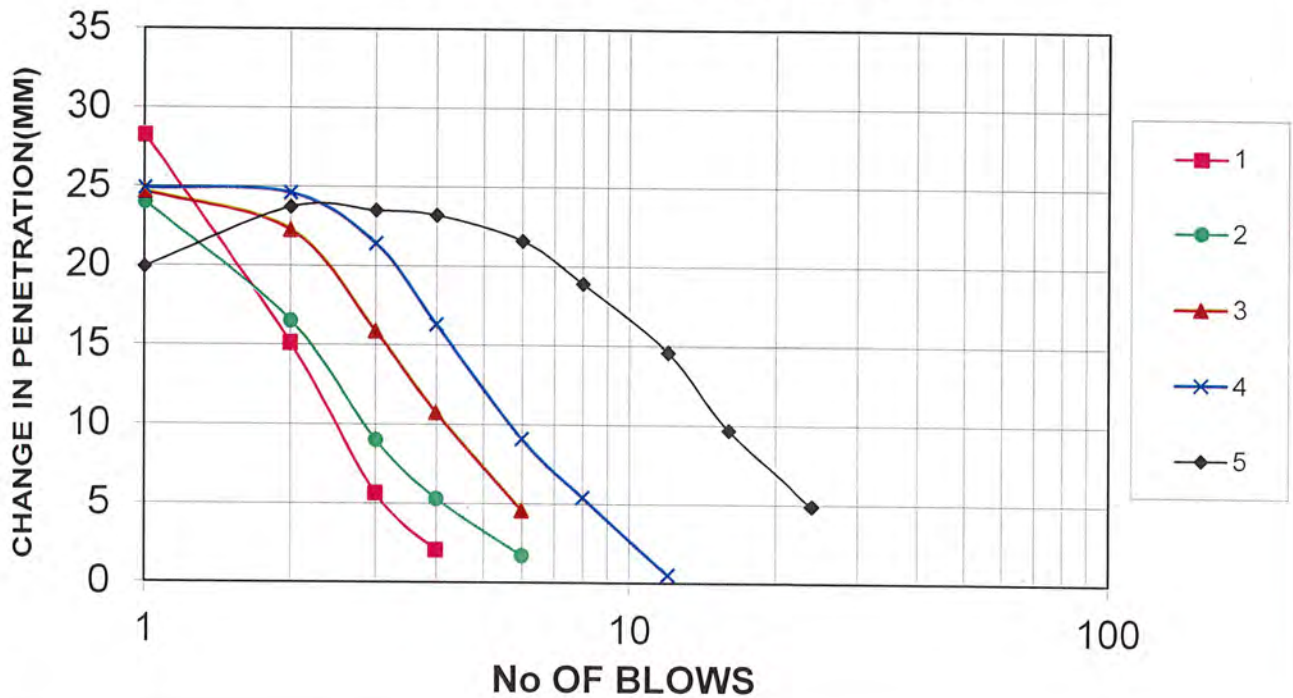


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC032 B7      **Specific Depth:** N/A

For sample description please refer to sample description sheet.

**CHANGE IN PENETRATION PLOT**



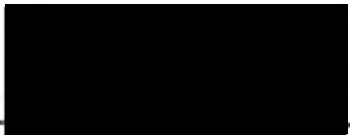
Sample	1	2 (NAT)	3	4	5
MCV	5.0	6.2	7.6	9.2	13.6
M.C.(%)	19	18	16	15	12
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					

Remarks: 5.6% Retained on 20mm sieve.

DATE TESTED: 07/05/2021

DATE OF ISSUE: 19/07/2021

APPROVED BY:



NAME: Michelle Selkirk





## ALLIED EXPLORATION & GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co Durham DH2 2RG  
 a UKAS Testing Laboratory No.1367

**MOISTURE CONDITION VALUE (BS 1377:PART4:1990 CLAUSE 5)**

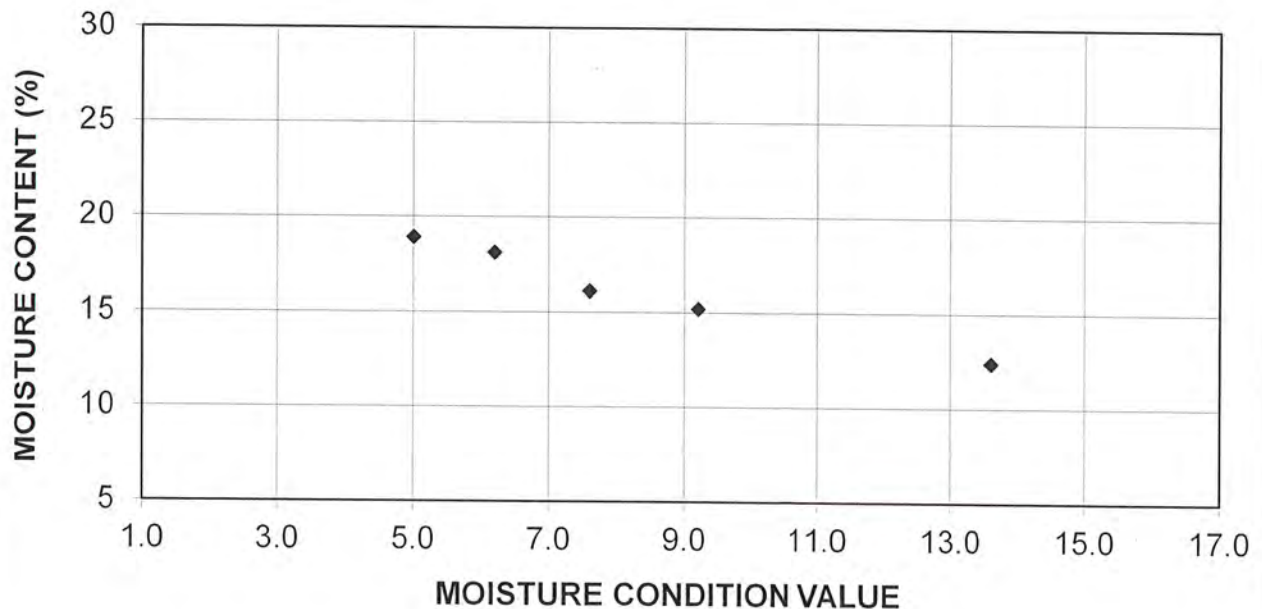


No. 1367

**SITE:** A66 North Trans Pennine Scheme C Section 9      **JOB No:** 4322A  
**CLIENT:** AMEY OW Limited      **Depth:** 1.00m  
**Sample No:** TP SBC032 B7      **Specific Depth:** N/A

**For sample description please refer to sample description sheet.**

### CALIBRATION LINE



Sample	1	2 (NAT)	3	4	5
MCV	5.0	6.2	7.6	9.2	13.6
M.C.(%)	19	18	16	15	12
<b>MCV = 10 Log No. OF BLOWS @ 5MM PENETRATION</b>					
<b>INTERCEPT (MC% AXIS)</b>			22.44	<b>REMARKS:</b>	
<b>SLOPE</b>			-0.758		
<b>SENSITIVITY (1/SLOPE)</b>			-1.320		

## Determination of California Bearing Ratio





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pellon Fell, Chester-le-Street, Co. Durham, DH2 2JL  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

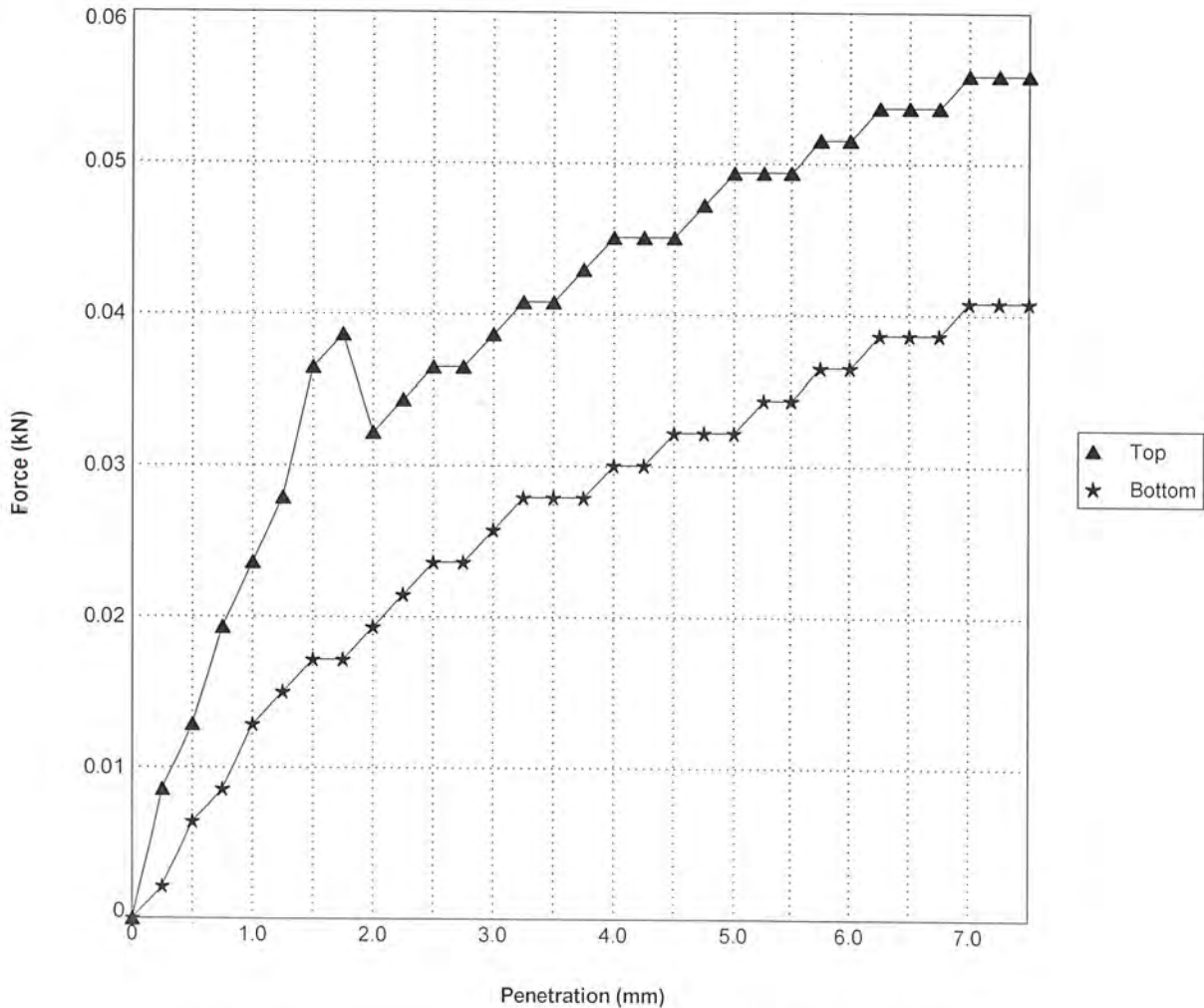
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **BH SBC005**

Sample No.- **B10**

Depth (m)- **2.50**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	4.7	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 25 / Bottom 24
Soaking Time (Days) :	11	Bulk Density (Mg/m <sup>3</sup> ) :	1.96
Swelling (mm) :	1.08	Dry Density (Mg/m <sup>3</sup> ) :	1.57
Date Tested :	07/05/2021	CBR Value (%) :	Top 0.30 / Bottom 0.20
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed :-



Name :-

**M. SELKIRK**

Page 1 of 1

Date of issue :-

24/05/2021

Certificate No :-

CBR/4322A/BH SBC005/B10/2.50/1

AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

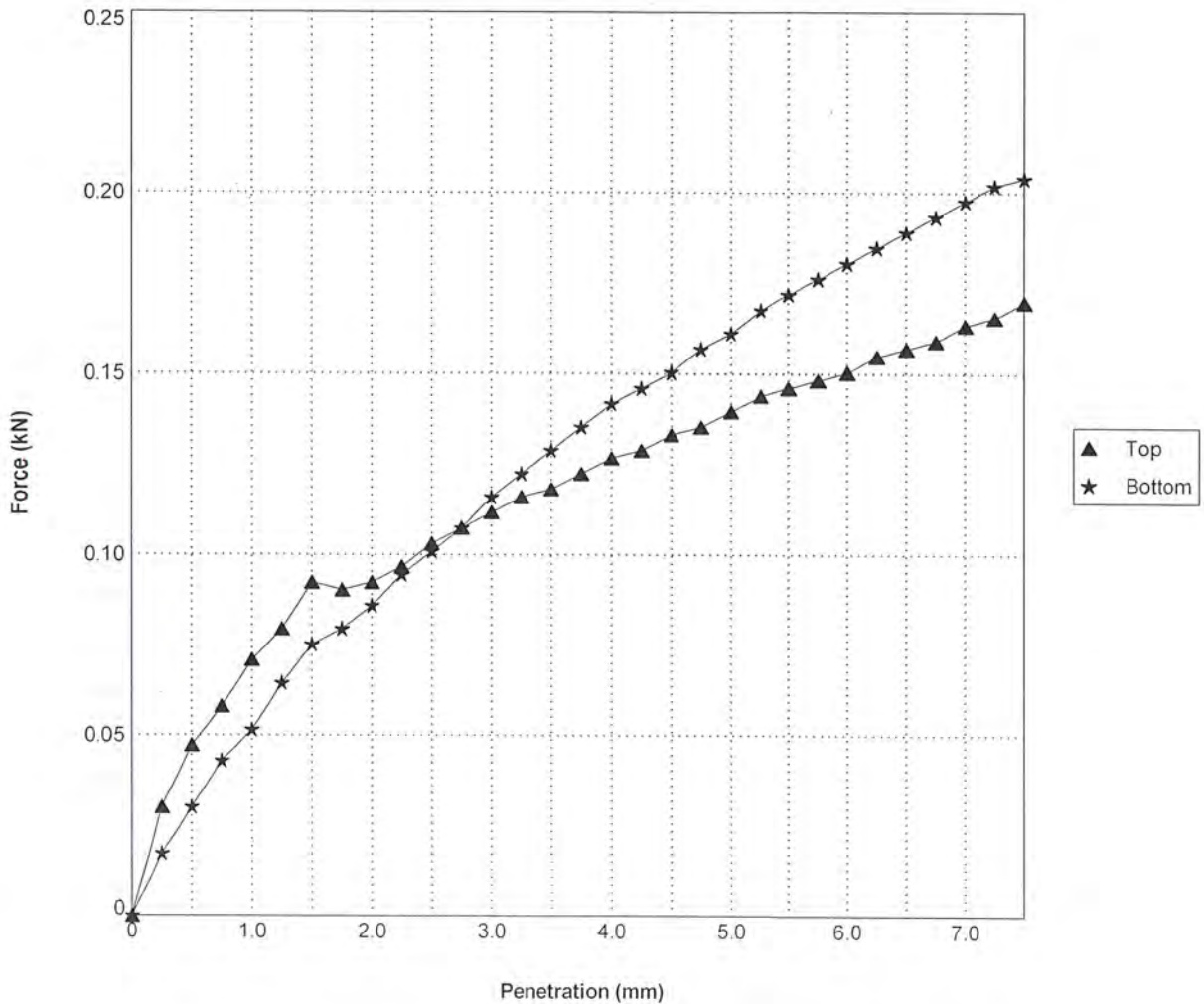
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **BH SBC007**

Sample No.- **B8**



Depth (m)- **1.20**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	0.6	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 32 / Bottom 31
Soaking Time (Days) :	14	Bulk Density (Mg/m <sup>3</sup> ) :	1.90
Swelling (mm) :	0.24	Dry Density (Mg/m <sup>3</sup> ) :	1.44
Date Tested :	04/05/2021	CBR Value (%) :	Top 0.78 / Bottom 0.81
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe [Redacted] Date of Issue: 24/05/2021	Name :- <b>M. SELKIRK</b> Certificate No :- CBR/4322A/BH SBC007/B8/1.20/1	Page 1 of 1 AEG Contract No. :- <b>4322A</b>	
	1367			



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

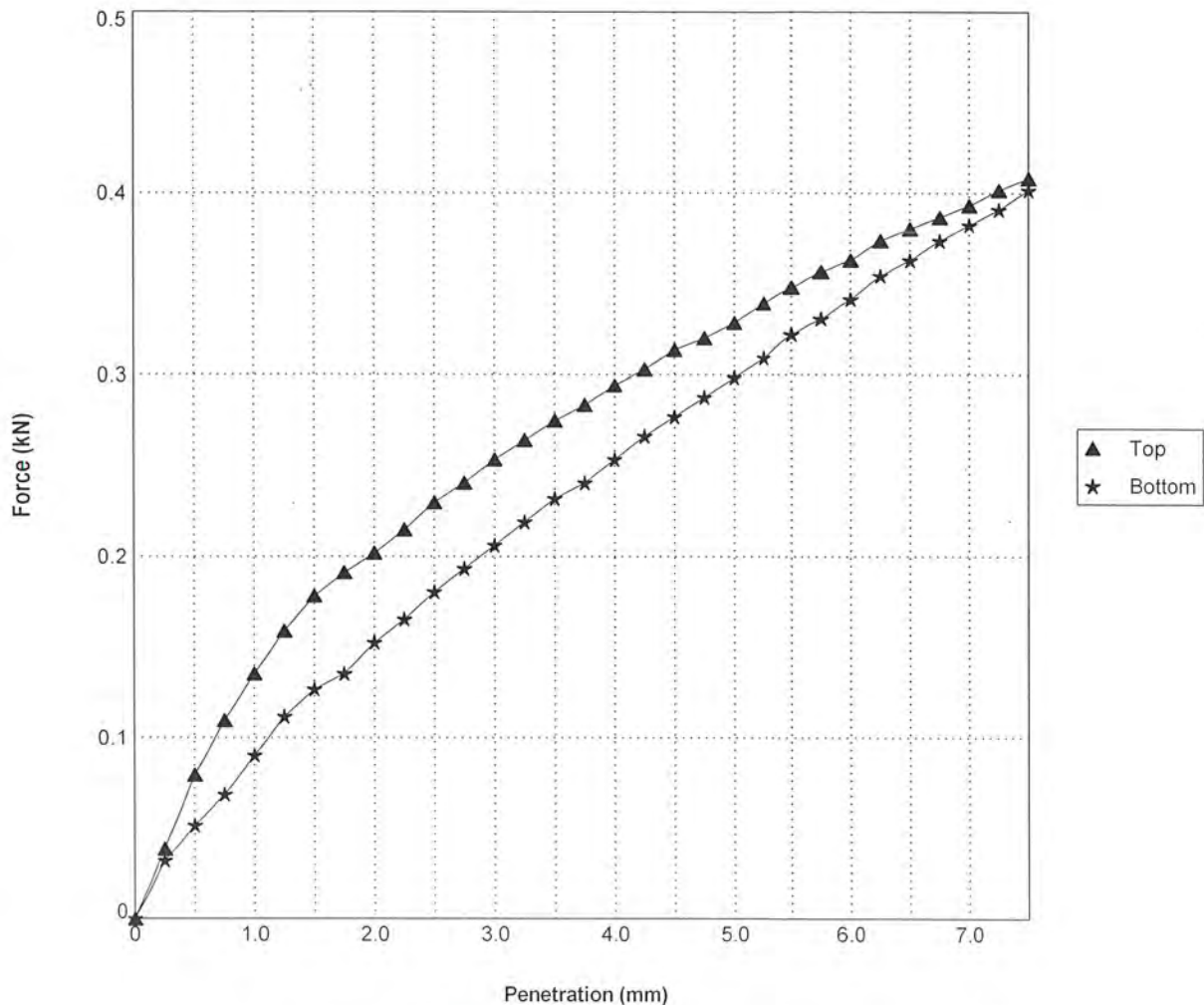
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - **BH SBC012**

Sample No. - **B32**



Depth (m) - **7.60**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	4.8	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 17 / Bottom 15
Soaking Time (Days) :	7	Bulk Density (Mg/m <sup>3</sup> ) :	2.16
Swelling (mm) :	0.22	Dry Density (Mg/m <sup>3</sup> ) :	1.86
Date Tested :	06/05/2021	CBR Value (%) :	Top 1.7 / Bottom 1.5
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signed: [Redacted]	Name: <b>M. SELKIRK</b>	Page 1 of 1	
	Date of Issue: 17/05/2021	Certificate No :- CBR/4322A/BH SBC012/B32/7.60/1	AEG Contract No. :- <b>4322A</b>	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2P  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

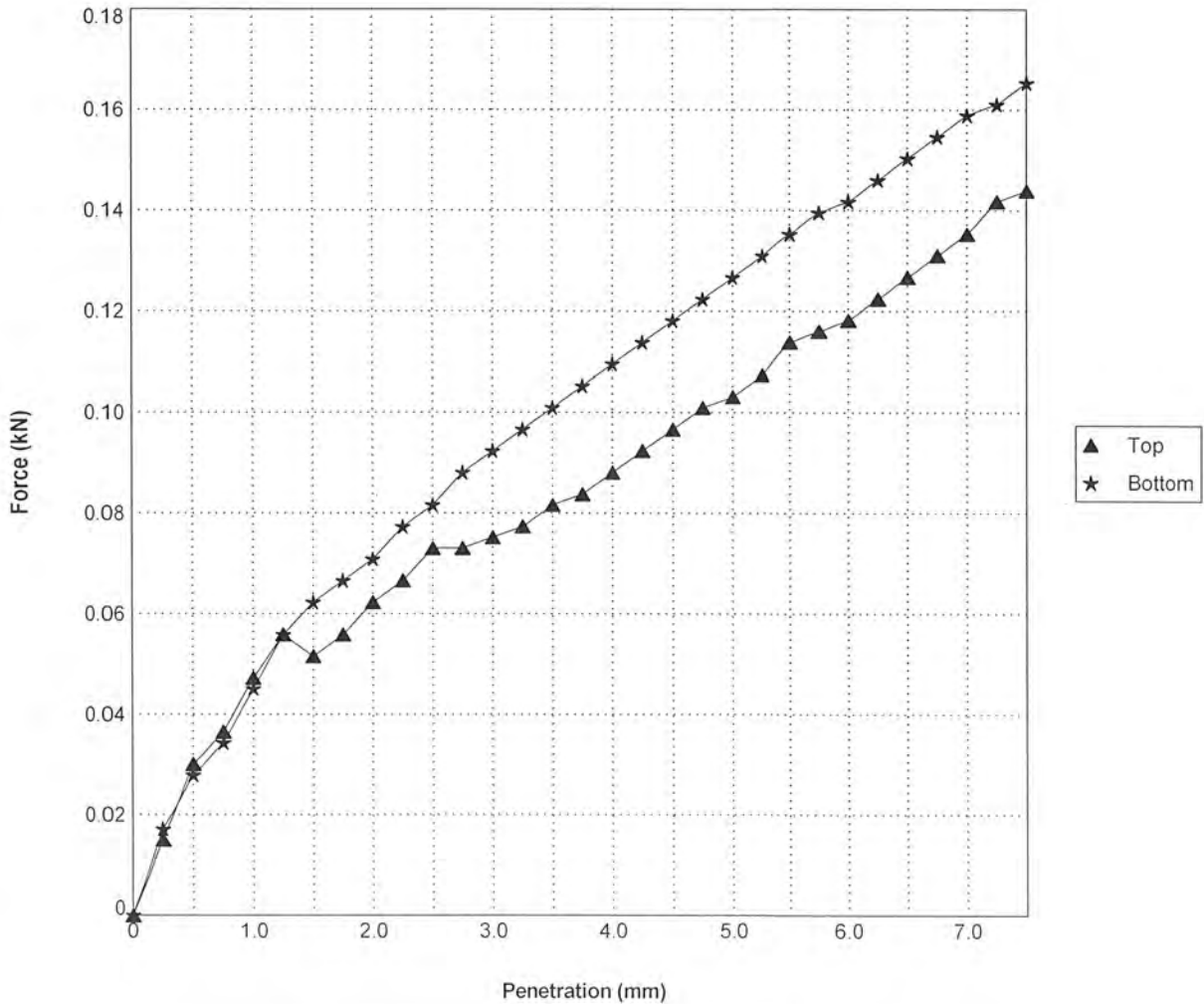
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- **BH SBC013**

Sample No.- **B32**

Depth (m)- **10.00**

"As Received" Moisture Content (%) :	Surcharge (Kg) :	6
Retained on 20mm (%) :	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	Test Moisture Content (%) :	Top 20 / Bottom 19
Soaking Time (Days) :	Bulk Density (Mg/m <sup>3</sup> ) :	2.09
Swelling (mm) :	Dry Density (Mg/m <sup>3</sup> ) :	1.75
Date Tested :	CBR Value (%) :	Top 0.55 / Bottom 0.63
Preparation Method :	4.5kg Compaction	
Remarks :		



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signe

Date

27/05/2021

Name :-

**M. SELKIRK**

Certificate No :-

CBR/4322A/BH SBC013/B32/10.00/1

AEG Contract No :-

4322A

Page 1 of 1



1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

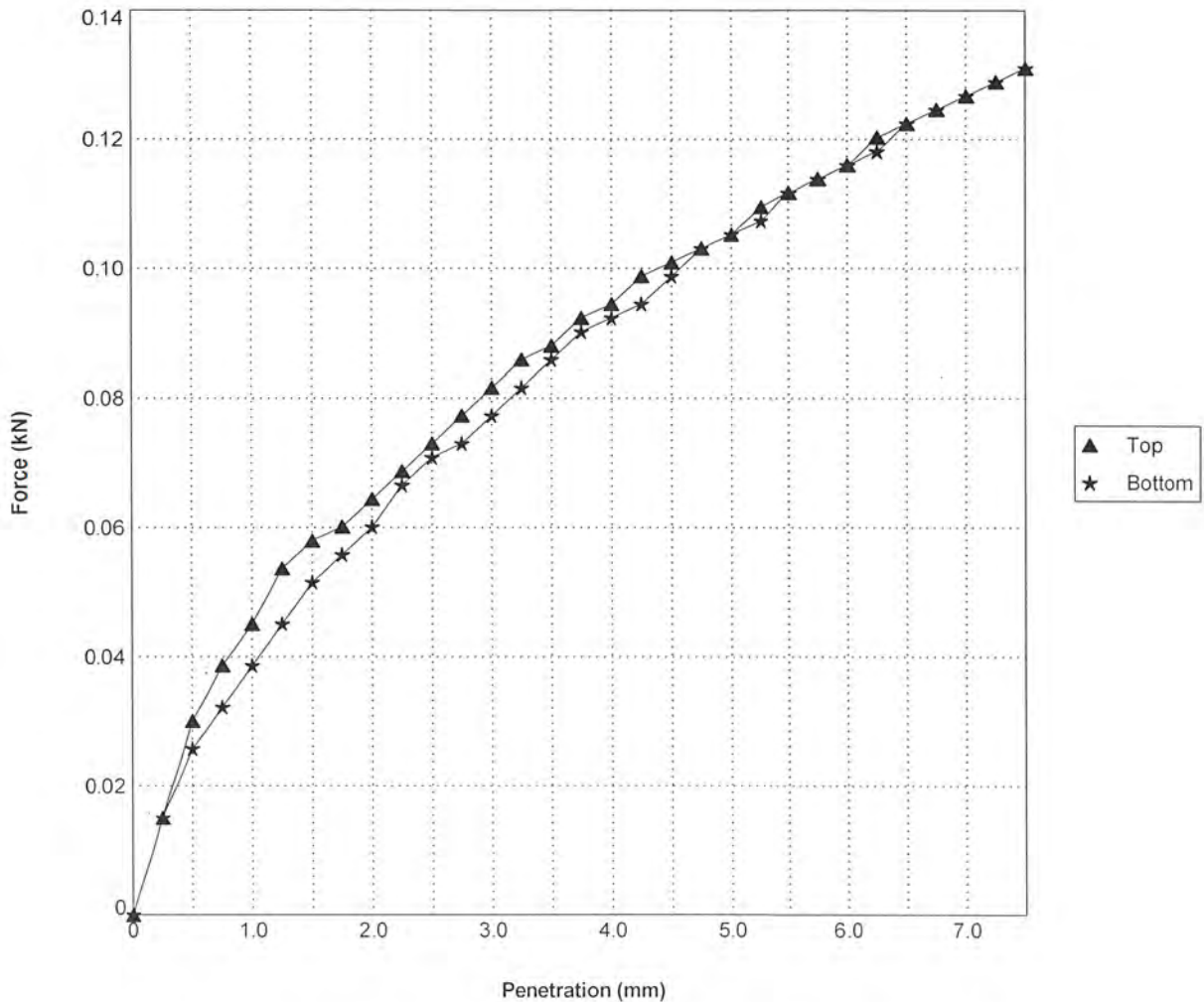
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - **BH SBC020**

Sample No. - **B21**



Depth (m) - **6.00**

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	3.9	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 19 / Bottom 17
Soaking Time (Days) :	7	Bulk Density (Mg/m <sup>3</sup> ) :	2.08
Swelling (mm) :	0.28	Dry Density (Mg/m <sup>3</sup> ) :	1.76
Date Tested :	19/04/2021	CBR Value (%) :	Top 0.55 / Bottom 0.54
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe [Redacted] Date of Issue: 30/04/2021	Name :- <b>M. SELKIRK</b> Certificate No :- CBR/4322A/BH SBC020/B21/6.00/1	Page 1 of 1 AEG Contract No. :- <b>4322A</b>	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2P  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

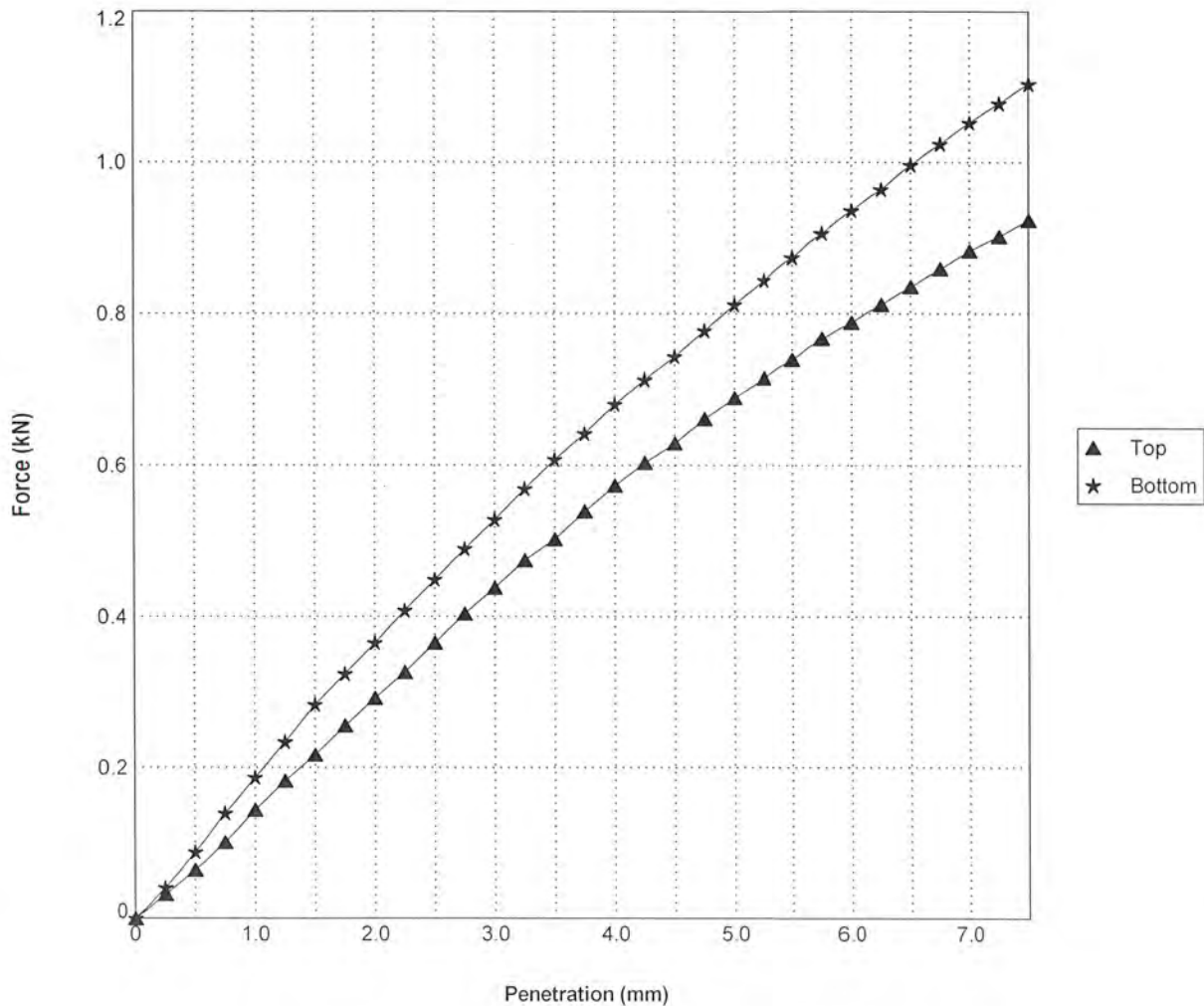
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - BH SBC021

Sample No. - B12

Depth (m) - 2.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	1.7	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 15 / Bottom 18
Soaking Time (Days) :	14	Bulk Density (Mg/m <sup>3</sup> ) :	2.18
Swelling (mm) :	0.52	Dry Density (Mg/m <sup>3</sup> ) :	1.89
Date Tested :	19/05/2021	CBR Value (%) :	Top 3.5 / Bottom 4.1
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

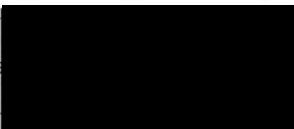
A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signe



Name :-

**M. SELKIRK**

Page 1 of 1

Date of Issue :-

09/06/2021

Certificate No :-

CBR/4322A/BH SBC021/B12/2.00/1

AEG Contract No. :-

4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

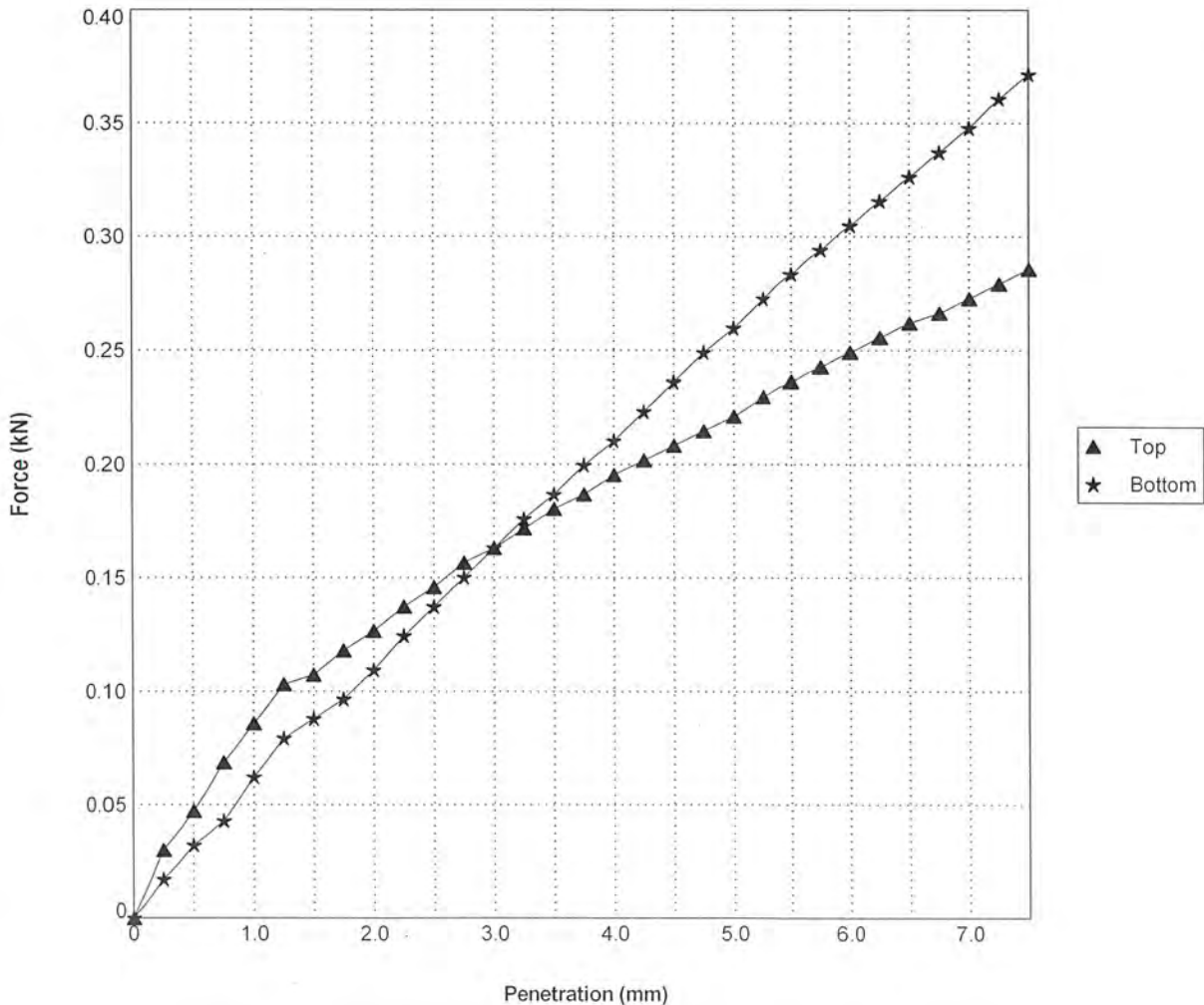
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- BH SBC026

Sample No.- B15



Depth (m)- 3.40

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	14.9	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 15 / Bottom 14
Soaking Time (Days) :	7	Bulk Density (Mg/m <sup>3</sup> ) :	2.18
Swelling (mm) :	0.36	Dry Density (Mg/m <sup>3</sup> ) :	1.91
Date Tested :	19/05/2021	CBR Value (%) :	Top 1.1 / Bottom 1.3
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe [Redacted Signature]	Name :- <b>M. SELKIRK</b>	Page 1 of 1	
	Date 28/05/2021	Certificate No :- CBR/4322A/BH SBC026/B15/3.40/1	AEG Contract No. :- <b>4322A</b>	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

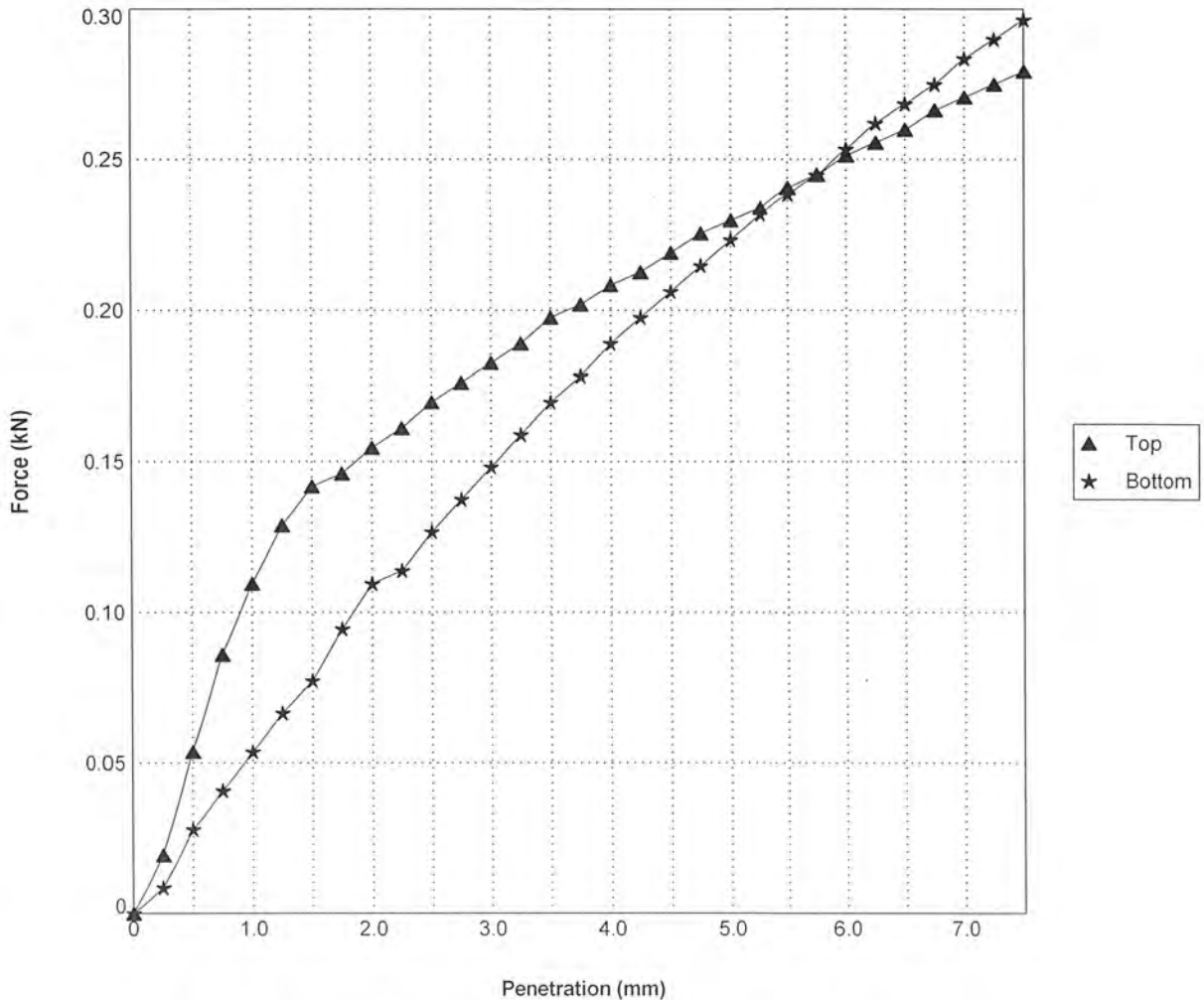
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - TP SBC005

Sample No. - B4


Depth (m) - 1.00

"As Received" Moisture Content (%) :	Surcharge (Kg) :	6	
Retained on 20mm (%) :	15.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 27 / Bottom 24
Soaking Time (Days) :	7	Bulk Density (Mg/m <sup>3</sup> ) :	1.98
Swelling (mm) :	0.14	Dry Density (Mg/m <sup>3</sup> ) :	1.58
Date Tested :	06/05/2021	CBR Value (%) :	Top 1.3 / Bottom 1.1
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signer: [Redacted]	Name: <b>M. SELKIRK</b>	Page 1 of 1
	Date: 17/05/2021	Certificate No. :- CBR/4322A/TP SBC005/B4/1.00/1	AEG Contract No. :- 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

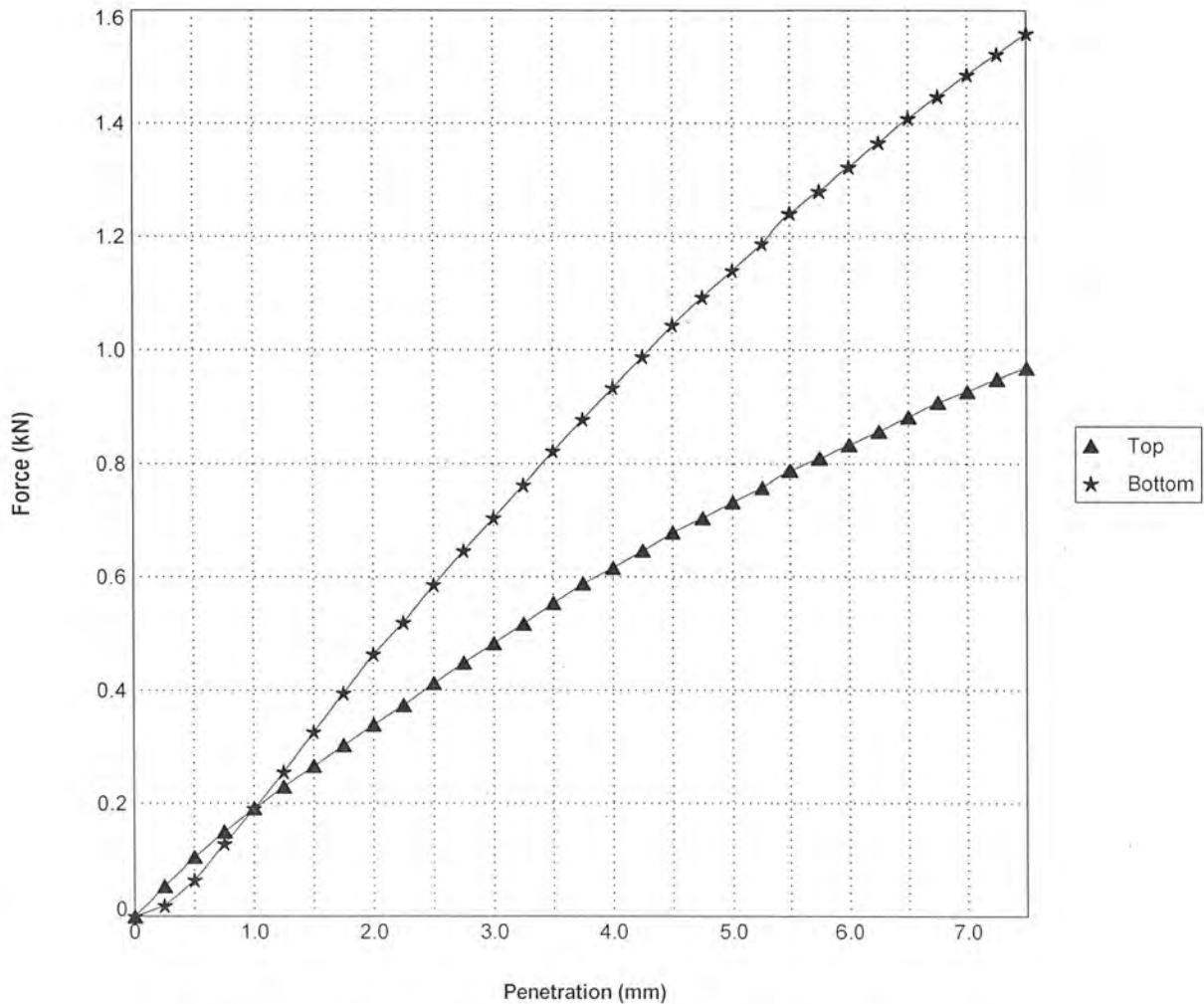
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - TP SBC011

Sample No. - B11



Depth (m) - 2.80

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	11.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 15 / Bottom 15
Soaking Time (Days) :	12	Bulk Density (Mg/m <sup>3</sup> ) :	2.17
Swelling (mm) :	0.34	Dry Density (Mg/m <sup>3</sup> ) :	1.89
Date Tested :	23/04/2021	CBR Value (%) :	Top 3.7 / Bottom 5.7
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe [Redacted] Date: 17/05/2021	Name :- <b>M. SELKIRK</b> Certificate No :- CBR/4322A/TP SBC011/B11/2.80/1	Page 1 of 1 AEG Contract No. :- <b>4322A</b>	

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

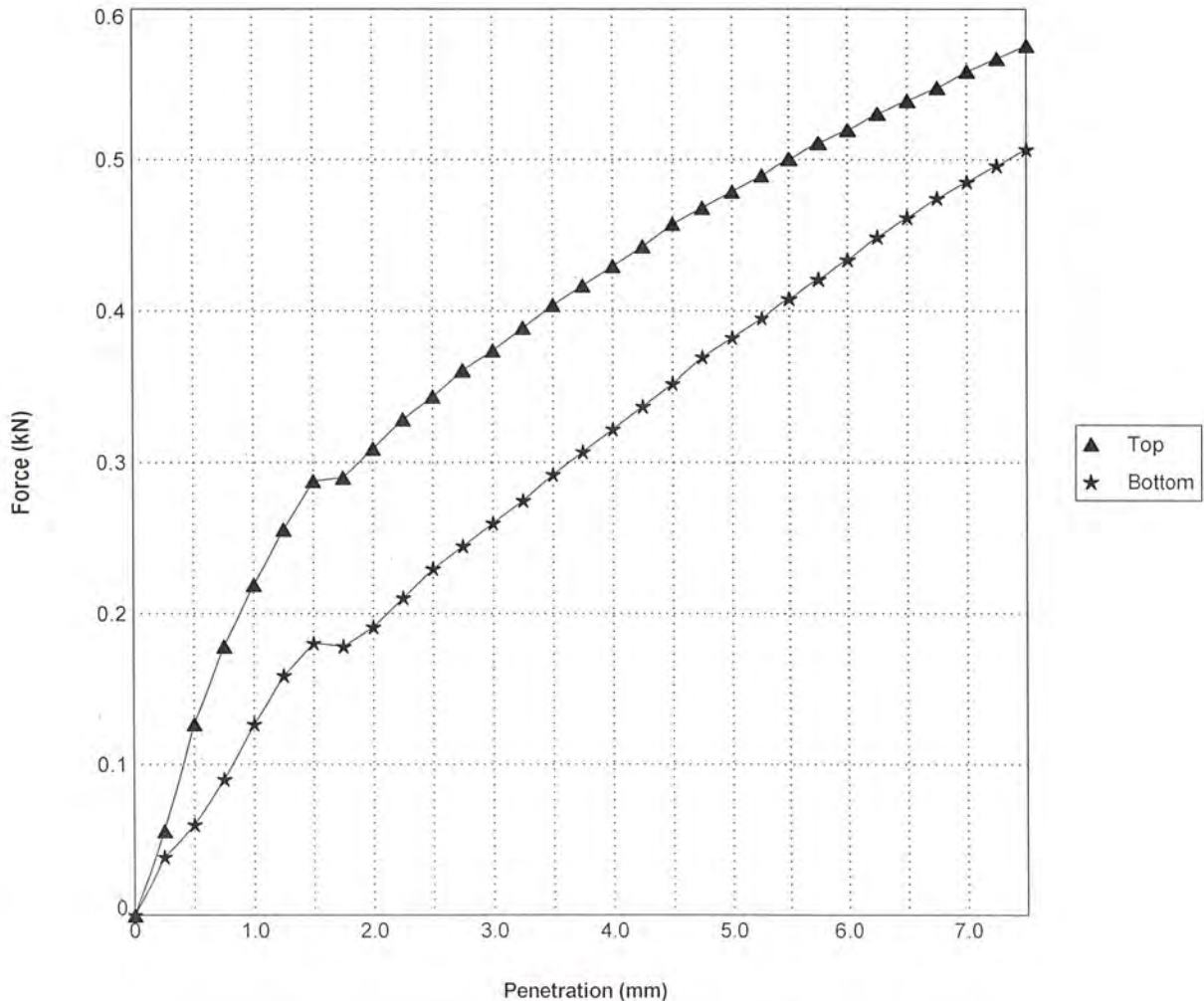
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC013

Sample No.- B10


Depth (m)- 3.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	6.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 16 / Bottom 16
Soaking Time (Days) :	7	Bulk Density (Mg/m <sup>3</sup> ) :	2.15
Swelling (mm) :	0.04	Dry Density (Mg/m <sup>3</sup> ) :	1.85
Date Tested :	07/05/2021	CBR Value (%) :	Top 2.6 / Bottom 1.9
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe [Redacted]	Name :- <b>M. SELKIRK</b>	Page 1 of 1
	Date 17/05/2021	Certificate No :- CBR/4322A/TP SBC013/B10/3.00/1	AEG Contract No :- <b>4322A</b>





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

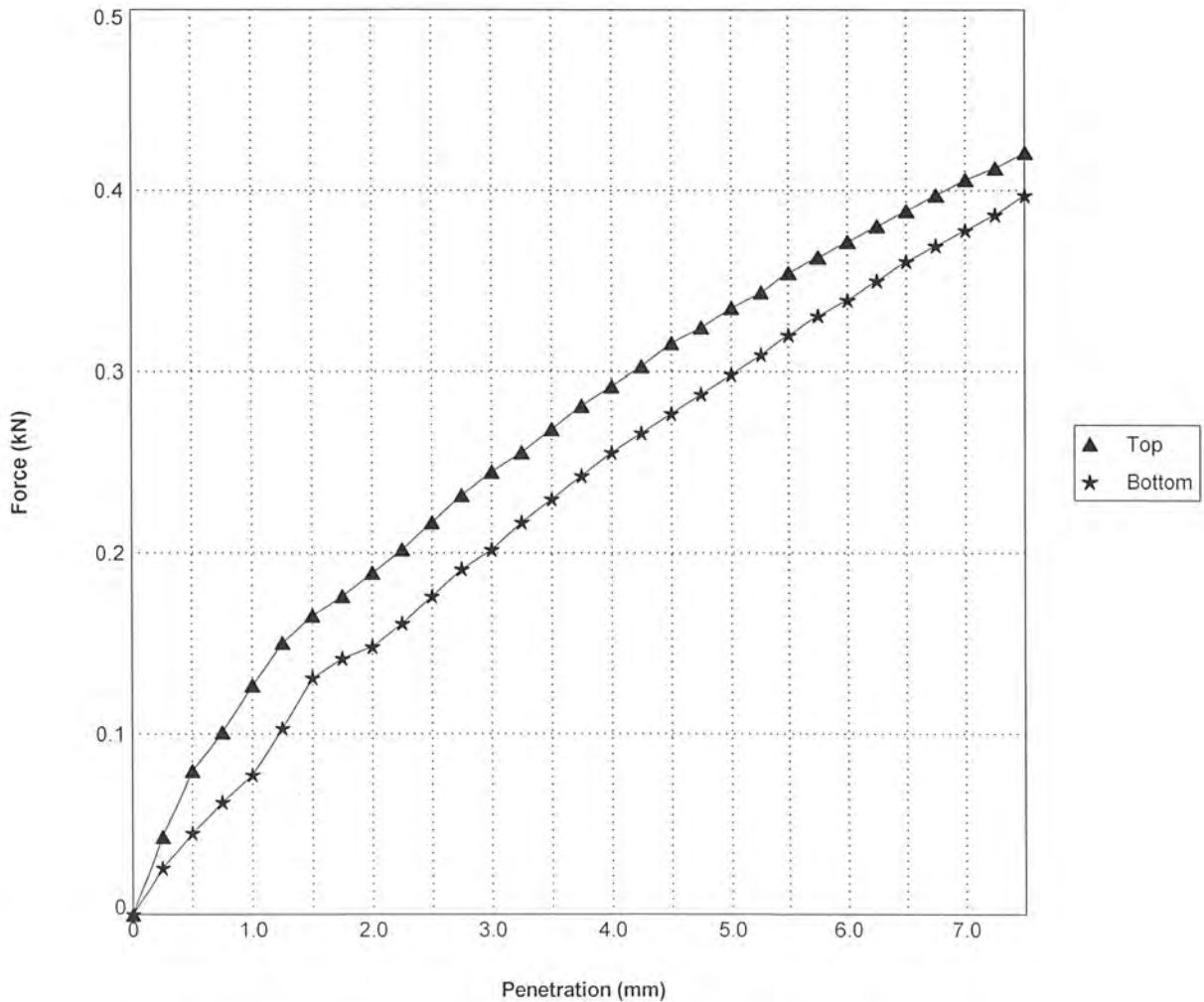
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC014

Sample No.- B14


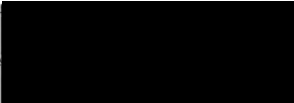


Depth (m)- 2.80

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	7.8	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 19 / Bottom 19
Soaking Time (Days) :	5	Bulk Density (Mg/m <sup>3</sup> ) :	2.11
Swelling (mm) :	0.08	Dry Density (Mg/m <sup>3</sup> ) :	1.77
Date Tested :	23/04/2021	CBR Value (%) :	Top 1.7 / Bottom 1.5
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe  Date 	Name :- <b>M. SELKIRK</b>	Page 1 of 1	
	Certificate No :- CBR/4322A/TP SBC014/B14/2.80/1	AEG Contract No :- 4322A		

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2P  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

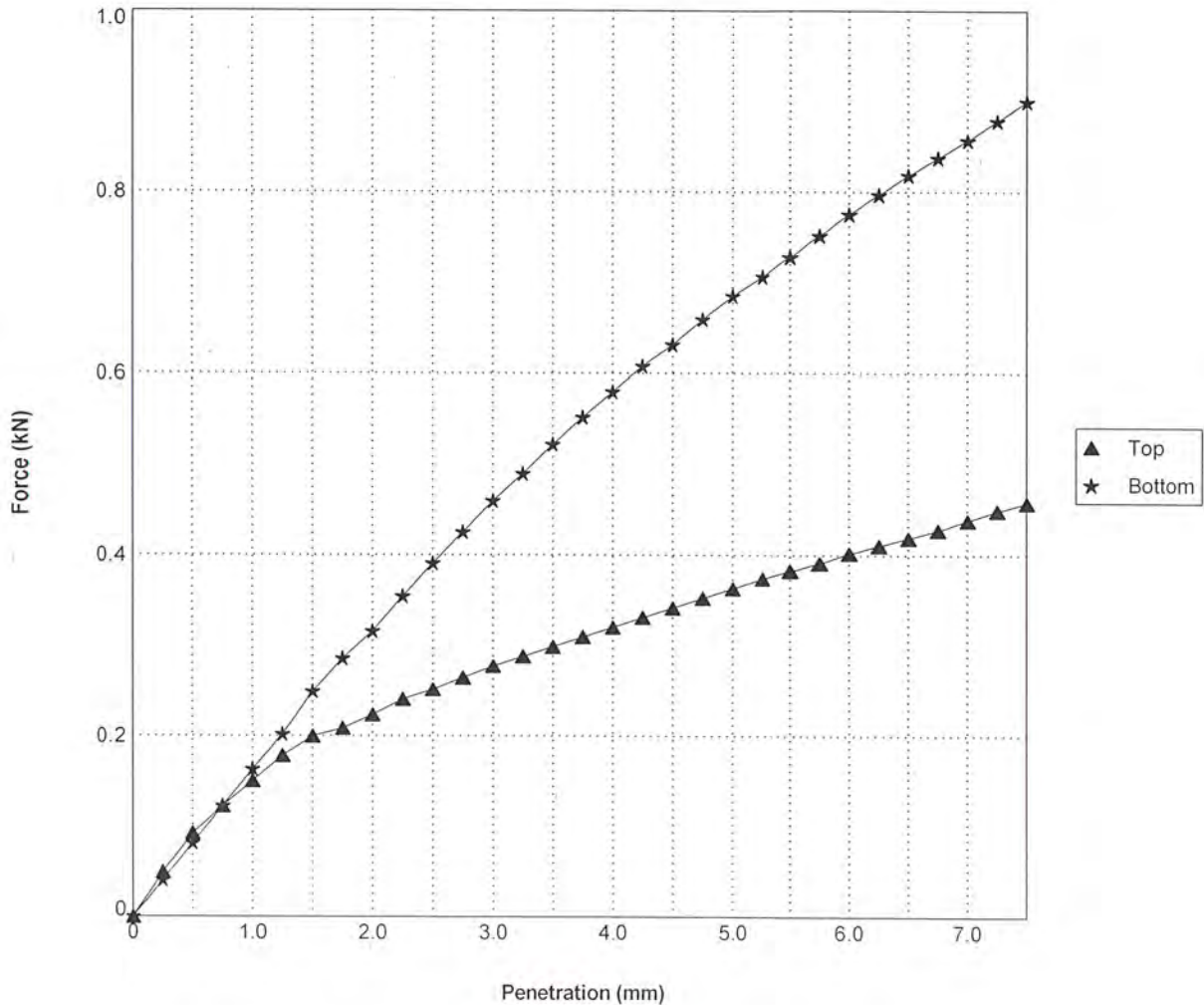
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC018

Sample No.- B6

Depth (m)- 1.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	4.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 21 / Bottom 20
Soaking Time (Days) :	20	Bulk Density (Mg/m <sup>3</sup> ) :	2.07
Swelling (mm) :	0.89	Dry Density (Mg/m <sup>3</sup> ) :	1.72
Date Tested :	15/04/2021	CBR Value (%) :	Top 1.9 / Bottom 3.4
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9

Client :- AMEY OW Limited



Signe [Redacted]  
 Date 17/05/2021

Name :- **M. SELKIRK**  
 Certificate No :- CBR/4322A/TP SBC018/B6/1.00/1

Page 1 of 1  
 AEG Contract No. :- 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

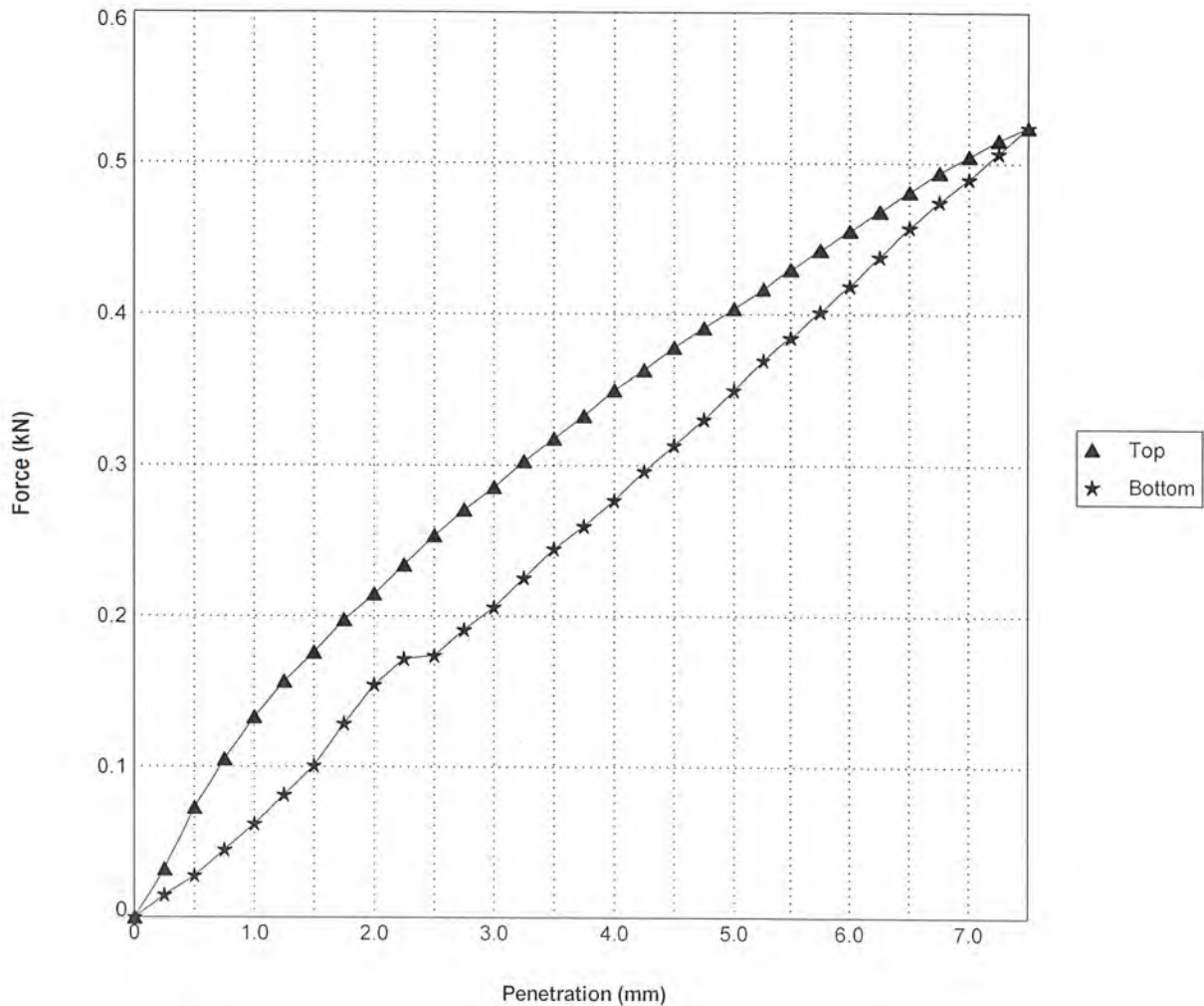
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC022

Sample No.- B7

Depth (m)- 2.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	28.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 16 / Bottom 18
Soaking Time (Days) :	5	Bulk Density (Mg/m <sup>3</sup> ) :	2.16
Swelling (mm) :	0.17	Dry Density (Mg/m <sup>3</sup> ) :	1.85
Date Tested :	07/05/2021	CBR Value (%) :	Top 2.0 / Bottom 1.8
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signature

[Redacted Signature]

Name :

**M. SELKIRK**

Page 1 of 1

Date

17/05/2021

Certificate No :-

CBR/4322A/TP SBC022/B7/2.00/1

AEG Contract No. :-

**4322A**



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2P  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

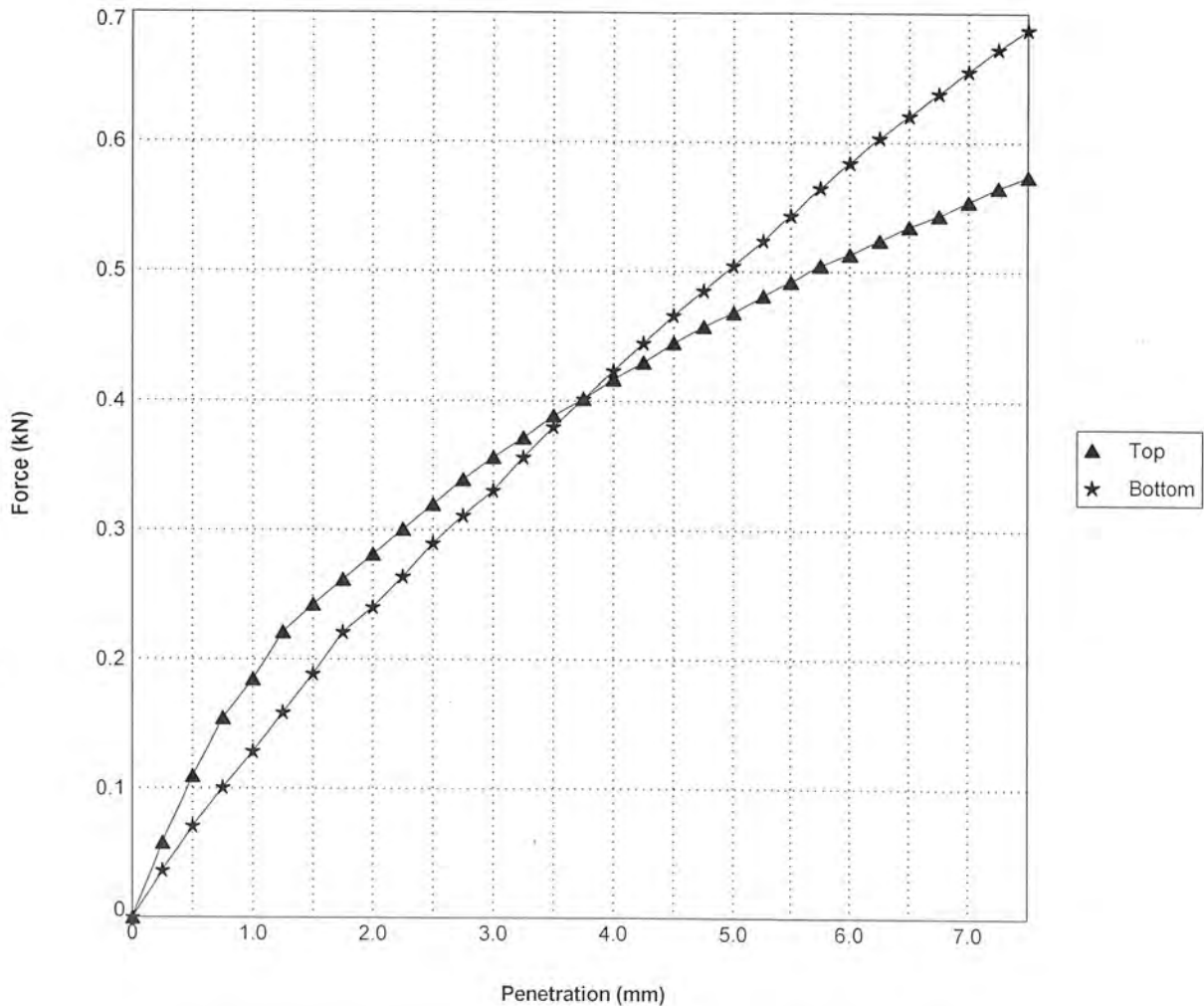
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC024

Sample No.- B4

Depth (m)- 1.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	6.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 19 / Bottom 17
Soaking Time (Days) :	29	Bulk Density (Mg/m <sup>3</sup> ) :	2.10
Swelling (mm) :	0.23	Dry Density (Mg/m <sup>3</sup> ) :	1.78
Date Tested :	26/04/2021	CBR Value (%) :	Top 2.4 / Bottom 2.5
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signature

[Redacted Signature]

Name :-

**M. SELKIRK**

Page 1 of 1

Date

27/05/2021

Certificate No :-

CBR/4322A/TP SBC024/B4/1.00/1

AEG Contract No. :-

4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

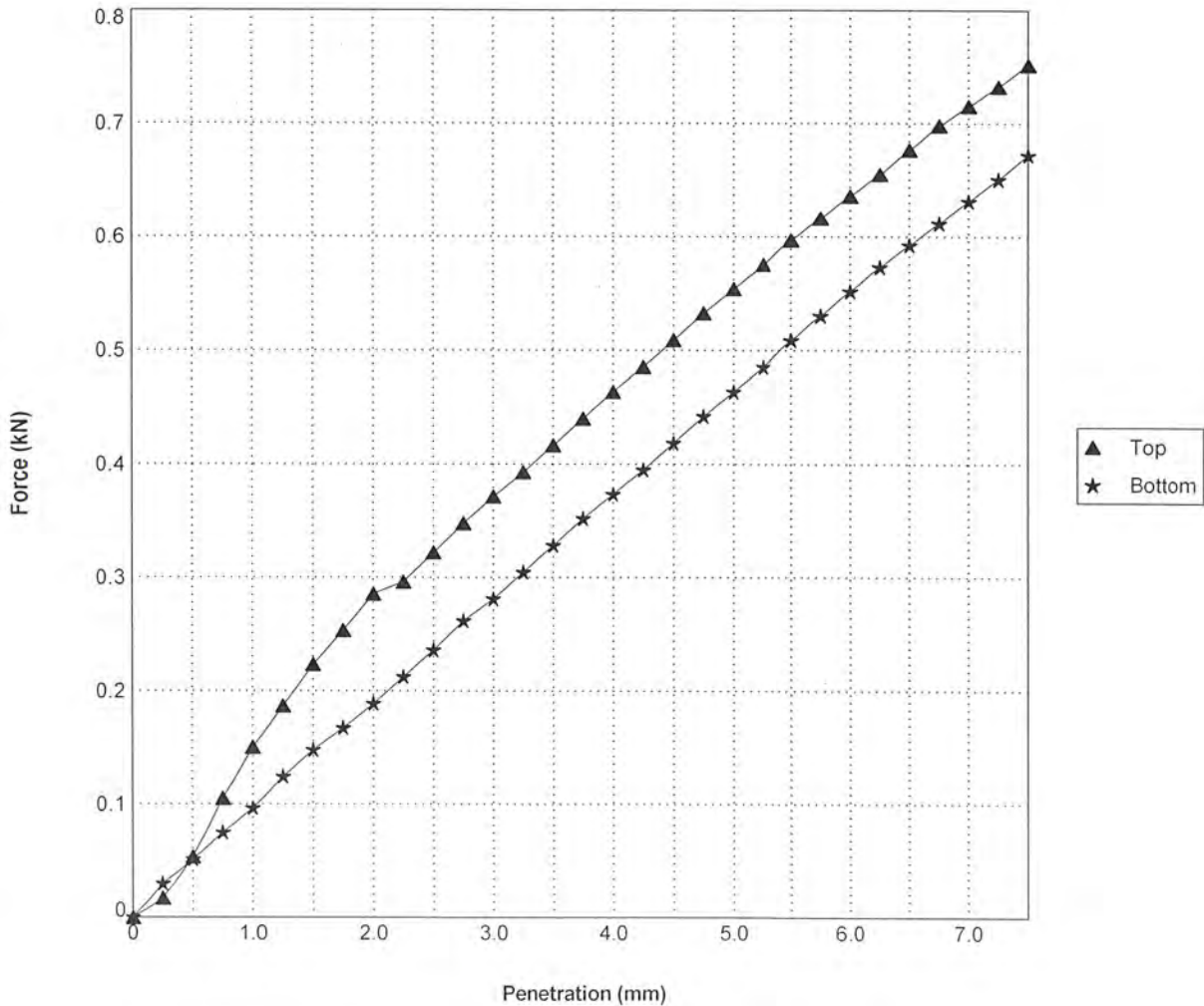
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No. - TP SBC024

Sample No. - B7

Depth (m) - 2.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	12.0	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 15 / Bottom 15
Soaking Time (Days) :	9	Bulk Density (Mg/m <sup>3</sup> ) :	2.19
Swelling (mm) :	0.23	Dry Density (Mg/m <sup>3</sup> ) :	1.91
Date Tested :	26/04/2021	CBR Value (%) :	Top 2.8 / Bottom 2.3
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signe



Name :-

**M. SELKIRK**

Page 1 of 1

Date

17/05/2021

Certificate No :-

CBR/4322A/TP SBC024/B7/2.00/1

AEG Contract No. :-

4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2P  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

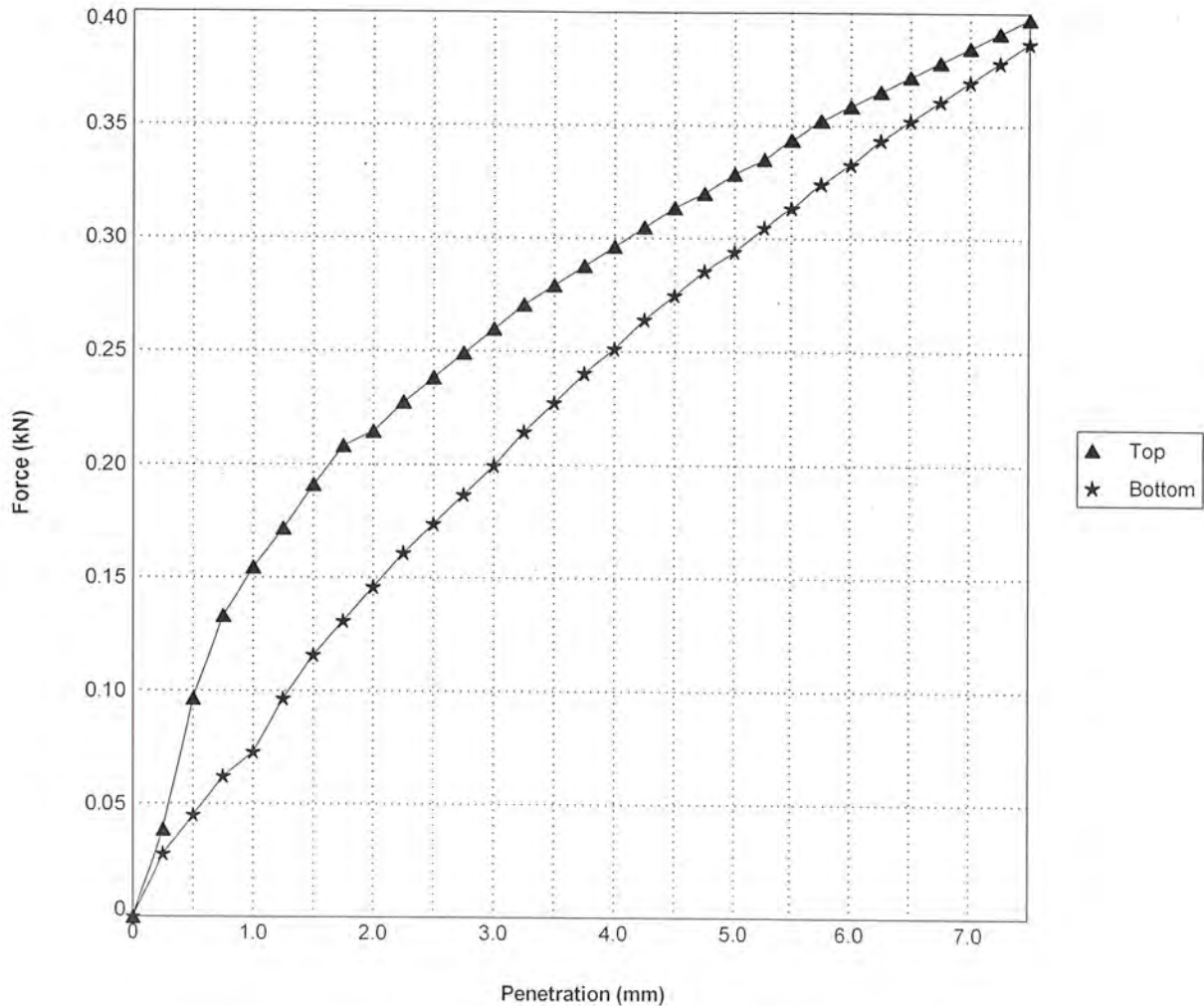
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC026

Sample No.- B5

Depth (m)- 1.00

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	8.0	Seating Load (N) :	Top 2.1481 / Bottom 2.1481
Correction Needed :	No	Test Moisture Content (%) :	Top 19 / Bottom 200
Soaking Time (Days) :	8	Bulk Density (Mg/m <sup>3</sup> ) :	2.08
Swelling (mm) :	0.2	Dry Density (Mg/m <sup>3</sup> ) :	1.74
Date Tested :	22/04/2021	CBR Value (%) :	Top 1.8 / Bottom 1.5
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signed

[Redacted Signature]

Name :-

**M. SELKIRK**

Page 1 of 1

Date

17/05/2021

Certificate No :-

CBR/4322A/TP SBC026/B5/1.00/1

AEG Contract No. :-

4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF THE CALIFORNIA BEARING RATIO

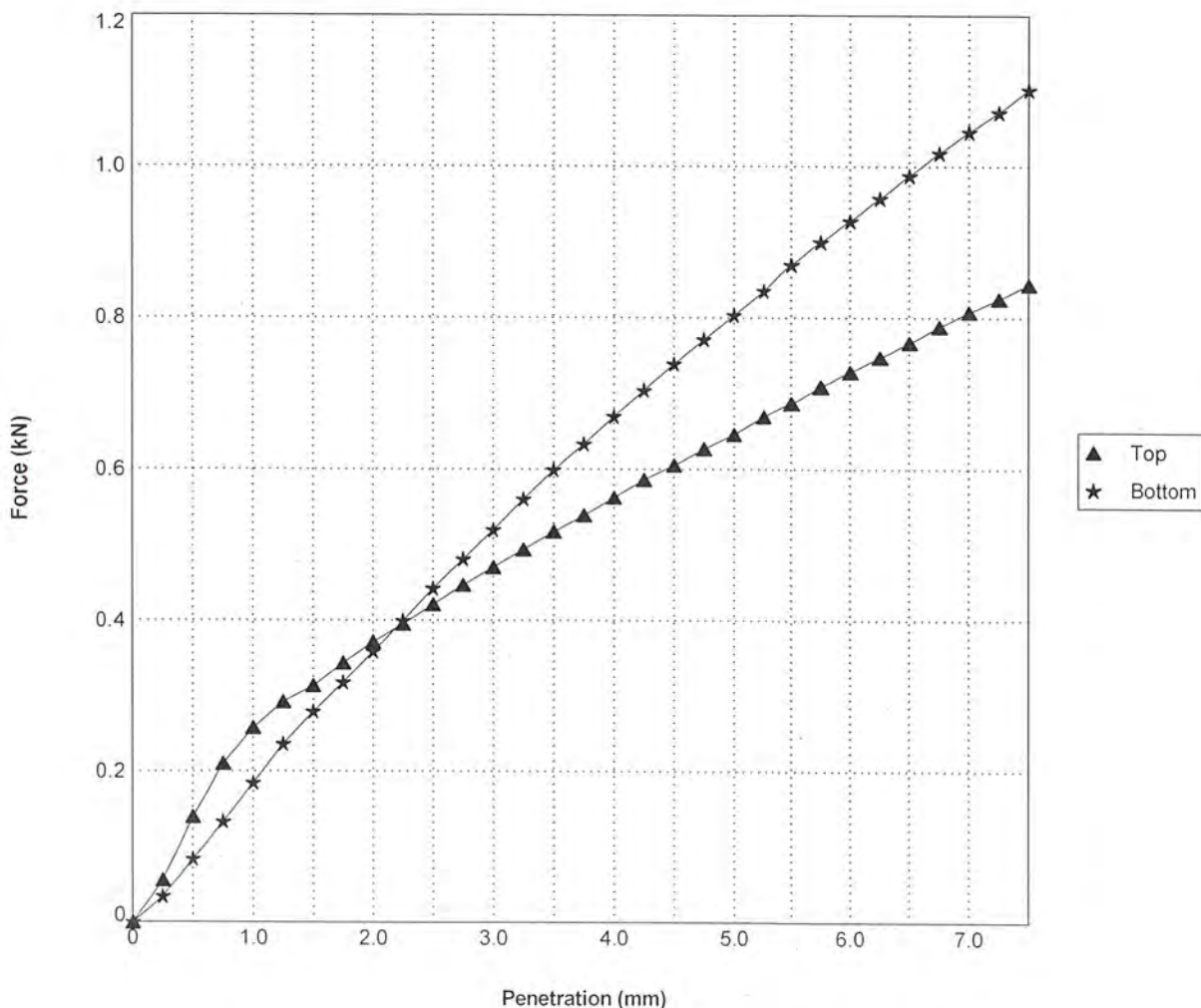
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- TP SBC028

Sample No.- B19

Depth (m)- 4.80

"As Received" Moisture Content (%) :		Surcharge (Kg) :	6
Retained on 20mm (%) :	7.3	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	No	Test Moisture Content (%) :	Top 13 / Bottom 12
Soaking Time (Days) :	12	Bulk Density (Mg/m <sup>3</sup> ) :	2.26
Swelling (mm) :	0.14	Dry Density (Mg/m <sup>3</sup> ) :	2.01
Date Tested :	22/04/2021	CBR Value (%) :	Top 3.2 / Bottom 4.0
Preparation Method :	4.5kg Compaction		
Remarks :			



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 9

Client :-

AMEY OW Limited



Signature

[Redacted Signature]

Name :

**M. SELKIRK**

Page 1 of 1

Date

17/05/2021

Certificate No :-

CBR/4322A/TP SBC028/B19/4.80/1

AEG Contract No. :-

4322A



## Determination of One Dimensional Consolidation Properties



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
Regional Office: Unit 20, Business Development Centre, Eanam Vihar, Blackburn, BB1 5B

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	<b>BH SBC002</b>	Sample	U8	Depth (m)	<b>2.50m</b>
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	<b>2.80m</b>
	INITIAL	FINAL			
Height	18.6	16.5	mm	Particle Density (Assumed)	2.70
Diameter	75.08	75.08	mm	Degree of Saturation (%)	93.0
Moisture Content	18.9	14.4	%	Test Duration (Days)	6
Wet Density	2.07	2.26	Mg/m <sup>3</sup>	Date Tested	06/05/2021
Dry Density	1.74	1.97	Mg/m <sup>3</sup>		

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Void Ratio
Initial				0.549
0 - 25	1.927	.	19	0.474
25 - 50	0.504	4.55	19	0.456
50 - 100	0.354	5.77	20	0.430
100 - 200	0.199	8.00	20	0.401
200 - 400	0.109	7.52	21	0.371
400 - 100	0.003	Swelling	21	0.372

For sample description please refer to the Laboratory Sample Description Sheet.

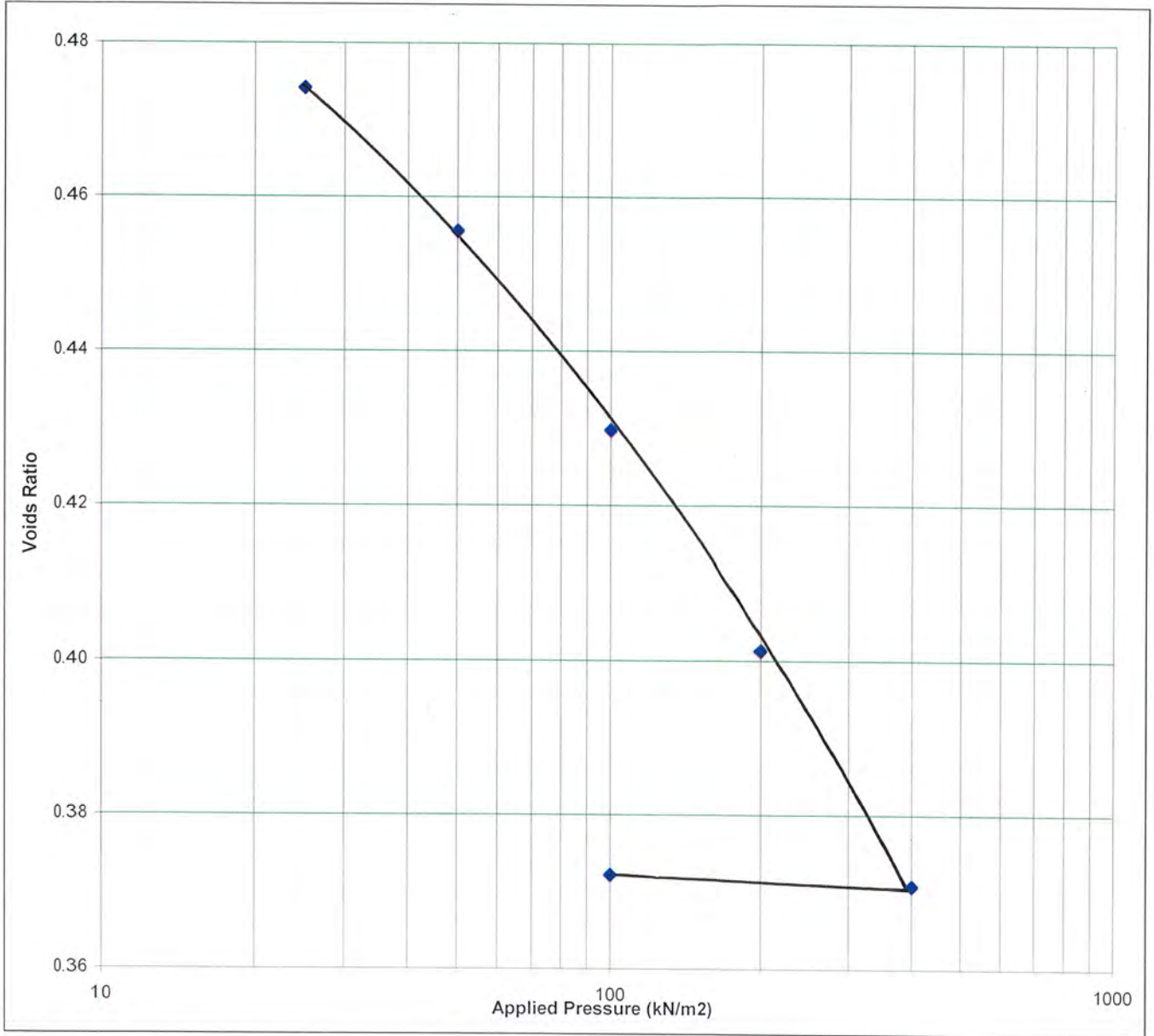
Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>		Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>	Page 1 of 2
	Date of Issue: 17/05/2021	Certificate No: 4322A/B	AEG Contract No: 4322A

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BB

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC002	Sample	U8	Depth (m)	2.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	2.80m



Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>	Client: <b>AMEY OW Limited</b>
--	-----------------------------------

	<b>[Redacted]</b>	Name: <b>M. SELKIRK</b>	Page 2 of 2
	Date of Issue: <b>17/05/2021</b>	Certificate No: <b>4322A/B</b>	AEG Contract No: <b>4322A</b>





# ALLIED EXPLORATION & GEOTECHNICS LIMITED


Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5B

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC014A	Sample	U17	Depth (m)	5.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	5.78m
	INITIAL	FINAL			
Height	18.9	17.8	mm	Particle Density (Assumed)	2.70
Diameter	75.06	75.06	mm		
Moisture Content	14.8	14.8	%	Degree of Saturation (%)	84.3
Wet Density	2.10	2.22	Mg/m <sup>3</sup>		
Dry Density	1.83	1.94	Mg/m <sup>3</sup>	Test Duration (Days)	7
Swelling Pressure = 6.25 kPa				Date Tested	05/05/2021

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.474
0 - 25	0.235	.	19	0.466
25 - 50	0.318	7.63	19	0.454
50 - 100	0.241	6.33	19	0.436
100 - 25	0.050	Swelling	20	0.442
25 - 100	0.066	7.78	20	0.435
100 - 200	0.140	6.85	21	0.415
200 - 400	0.100	5.18	21	0.386

For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>		Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>	Page 1 of 2
	Date of Issue: 17/05/2021	Certificate No: 4322A/C	AEG Contract No: 4322A

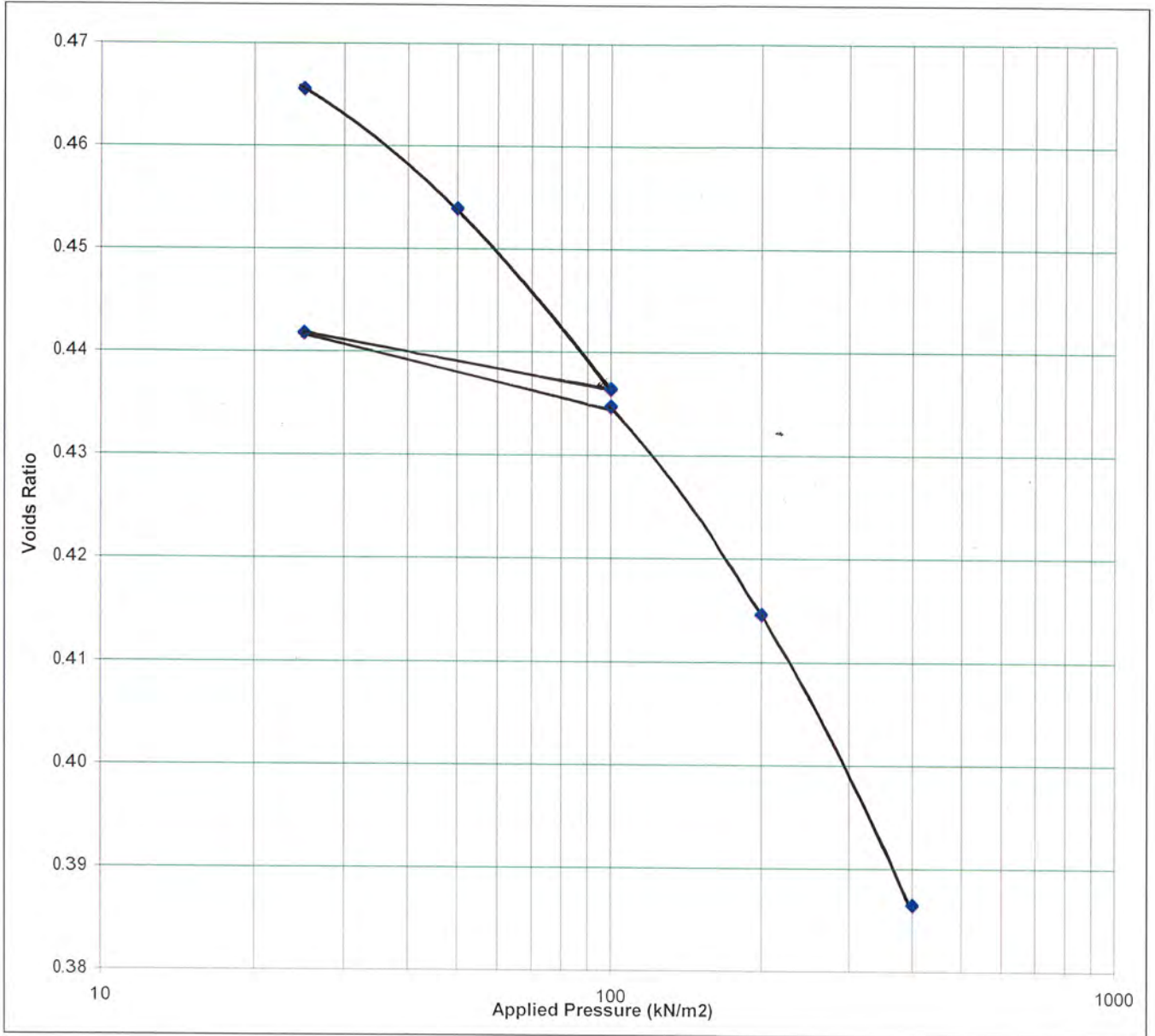
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5B

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC014A	Sample	U17	Depth (m)	5.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	5.78m



Contract Title:  
**A66 North Trans Pennine Scheme C Section 9**

Client:  
**AMEY OW Limited**



Signed: [Redacted]  
Date of: [Redacted]  
17/05/2021

Name:  
**M. SELKIRK**

Certificate No:  
4322A/C

Page 2 of 2

AEG Contract No:  
4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1 1JH  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5JH

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	<b>BH SBC017</b>	Sample	<b>U8</b>	Depth (m)	<b>2.50m</b>
Specimen Type	<b>Undisturbed</b>	Orientation	<b>Vertical</b>	Specific Depth (m)	<b>2.53m</b>
	INITIAL	FINAL			
Height	18.8	17.6	mm	Particle Density (Assumed)	2.70
Diameter	74.9	74.9	mm		
Moisture Content	16.0	13.0	%	Degree of Saturation (%)	98.1
Wet Density	2.17	2.28	Mg/m <sup>3</sup>		
Dry Density	1.87	2.02	Mg/m <sup>3</sup>	Test Duration (Days)	6
				Date Tested	26/05/2021

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.441
0 - 25	0.519	.	21	0.422
25 - 50	0.338	3.86	21	0.410
50 - 100	0.247	3.24	22	0.392
100 - 200	0.146	3.99	23	0.372
200 - 400	0.090	4.81	23	0.347
400 - 100	0.012	Swelling	23	0.352

For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>			Client: <b>AMEY OW Limited</b>	
	Signed: <div style="background-color: black; width: 150px; height: 30px; margin: 5px 0;"></div>	Name: <b>M. SELKIRK</b>		Page 1 of 2
	Date of Issue: 07/06/2021	Certificate No: 4322A/F	AEG Contract No: 4322A	
				 <b>1367</b>

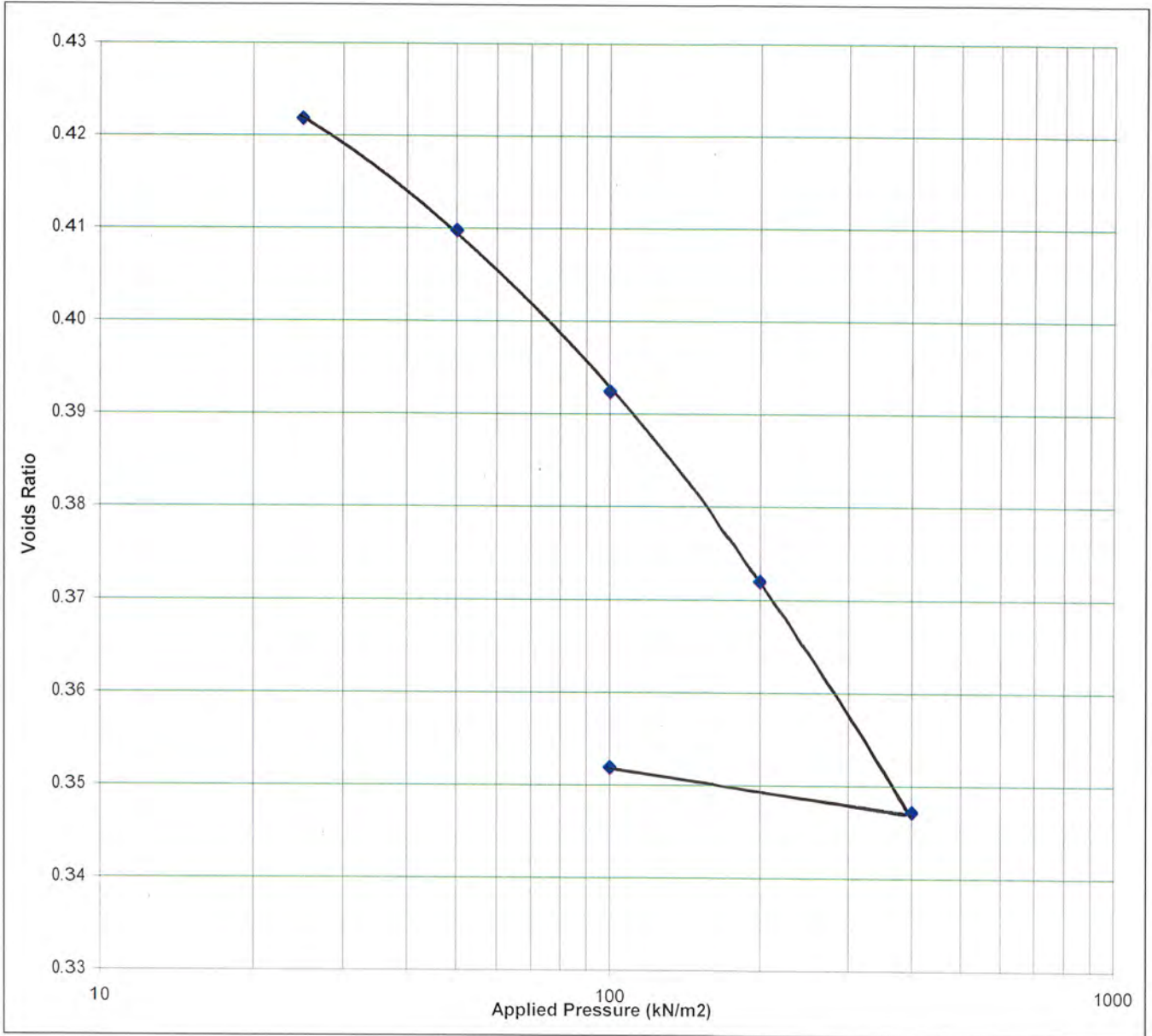
# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
 Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5SR

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC017	Sample	U8	Depth (m)	2.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	2.53m



Contract Title:  
**A66 North Trans Pennine Scheme C Section 9**

Client:  
**AMEY OW Limited**



Signed: [Redacted Signature]

Name:  
**M. SELKIRK**

Page 2 of 2

Date of Issue:  
 07/06/2021

Certificate No:  
 4322A/F

AEG Contract No:  
 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED


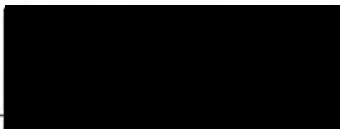
Head Office: Unit 25 Stella Gull Industrial Estate, Pelton Fall, Chester-le-Street, Co Durham, U.K.  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 1JH

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC023A	Sample	U31	Depth (m)	12.40m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	12.40m
	INITIAL	FINAL			
Height	18.7	17.3	mm	Particle Density (Assumed)	2.70
Diameter	75.19	75.19	mm	Degree of Saturation (%)	92.8
Moisture Content	20.0	18.6	%	Test Duration (Days)	6
Wet Density	2.05	2.17	Mg/m <sup>3</sup>		
Dry Density	1.71	1.83	Mg/m <sup>3</sup>		
Swelling Pressure = 12.5 kPa				Date Tested	05/05/2021

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.582
0 - 50	0.254	.	19	0.562
50 - 100	0.269	7.35	19	0.541
100 - 200	0.212	7.09	19	0.508
200 - 50	0.056	Swelling	20	0.521
50 - 200	0.072	7.34	20	0.504
200 - 400	0.126	4.97	21	0.466

For sample description please refer to the Laboratory Sample Description Sheet.

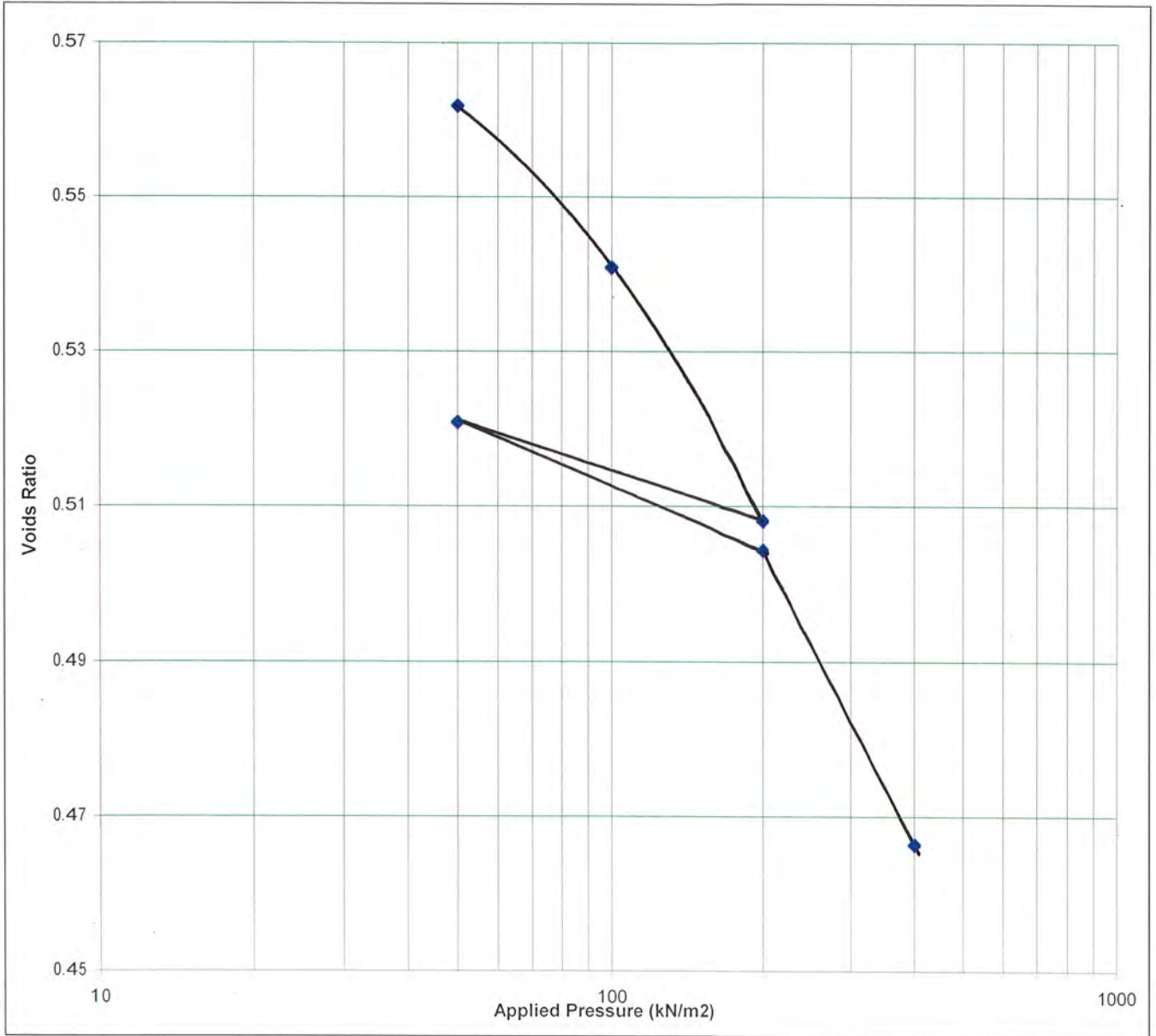
Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>		Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>	Page 1 of 2
	Date of Issue: 14/05/2021	Certificate No: 4322A/A	AEG Contract No: 4322A

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1 1JG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole NBH SBC023A	Sample	U31	Depth (m)	12.40m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)
				12.40m



Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>	Client: <b>AMEY OW Limited</b>
--	-----------------------------------

	Signed:	Name: <b>M. SELKIRK</b>	Page 2 of 2	
	Date of Issue: 14/05/2021	Certificate No: 4322A/A	AEG Contract No: 4322A	1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, UK  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 1BB

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC025	Sample	U17	Depth (m)	3.30m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	3.50m
	INITIAL	FINAL			
Height	18.8	17.9	mm	Particle Density (Assumed)	2.70
Diameter	74.46	74.46	mm		
Moisture Content	13.0	12.4	%	Degree of Saturation (%)	91.1
Wet Density	2.20	2.30	Mg/m <sup>3</sup>		
Dry Density	1.95	2.05	Mg/m <sup>3</sup>	Test Duration (Days)	5
				Date Tested	09/06/2021

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.385
0 - 50	0.223	.	25	0.370
50 - 100	0.182	7.15	24	0.357
100 - 200	0.139	6.98	24	0.338
200 - 400	0.095	5.80	23	0.313
400 - 100	0.013	Swelling	22	0.318

For sample description please refer to the Laboratory Sample Description Sheet.

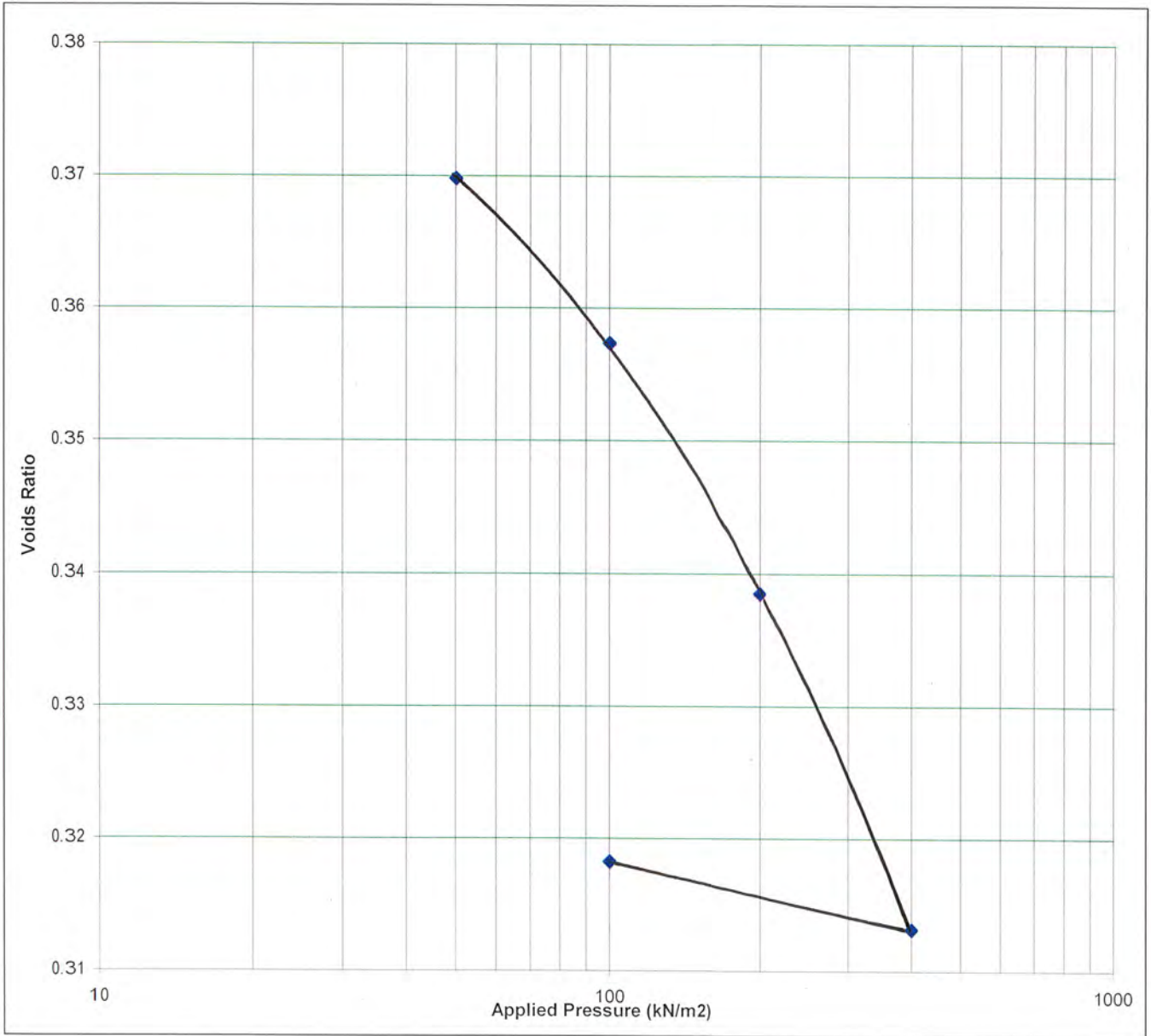
Contract Title:		Client:	
A66 North Trans Pennine Scheme C Section 9		AMEY OW Limited	
	Signed:	Name:	Page 1 of 2
		M. SELKIRK	
Date of Issue:	Certificate No:	AEG Contract No:	
17/06/2021	4322A/G	4322A	1367




# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2  
 Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	BH SBC025	Sample	U17	Depth (m)	3.30m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth (m)	3.50m



Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>		Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>	
	Date of Issue: 17/06/2021	Certificate No: 4322A/G	AEG Contract No: 4322A
			 Page 2 of 2 1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED


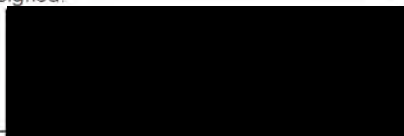

Head Office: Unit 25 Stella Gill Industrial Estate, Pilton Fall, Chester-le-Street, Co Durham, DH2 1JG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5B

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

<b>Exploratory Hole No</b>	<b>BH SBC031</b>	<b>Sample</b>	<b>U19</b>	<b>Depth (m)</b>	<b>6.50m</b>
<b>Specimen Type</b>	<b>Undisturbed</b>	<b>Orientation</b>	<b>Vertical</b>	<b>Specific Depth (m)</b>	<b>6.53m</b>
	<b>INITIAL</b>	<b>FINAL</b>			
Height	18.8	17.2	mm	Particle Density (Assumed)	2.70
Diameter	75.13	75.13	mm	Degree of Saturation (%)	82.9
Moisture Content	12.5	11.8	%	Test Duration (Days)	7
Wet Density	2.16	2.33	Mg/m <sup>3</sup>	Date Tested	06/05/2021
Dry Density	1.92	2.08	Mg/m <sup>3</sup>		

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.407
0 - 50	0.239	.	19	0.390
50 - 100	0.195	7.43	19	0.377
100 - 200	0.161	10.20	20	0.354
200 - 50	0.024	Swelling	20	0.359
50 - 200	0.037	10.98	21	0.352
200 - 400	0.100	8.67	21	0.325
400 - 800	0.066	4.54	21	0.290

For sample description please refer to the Laboratory Sample Description Sheet.

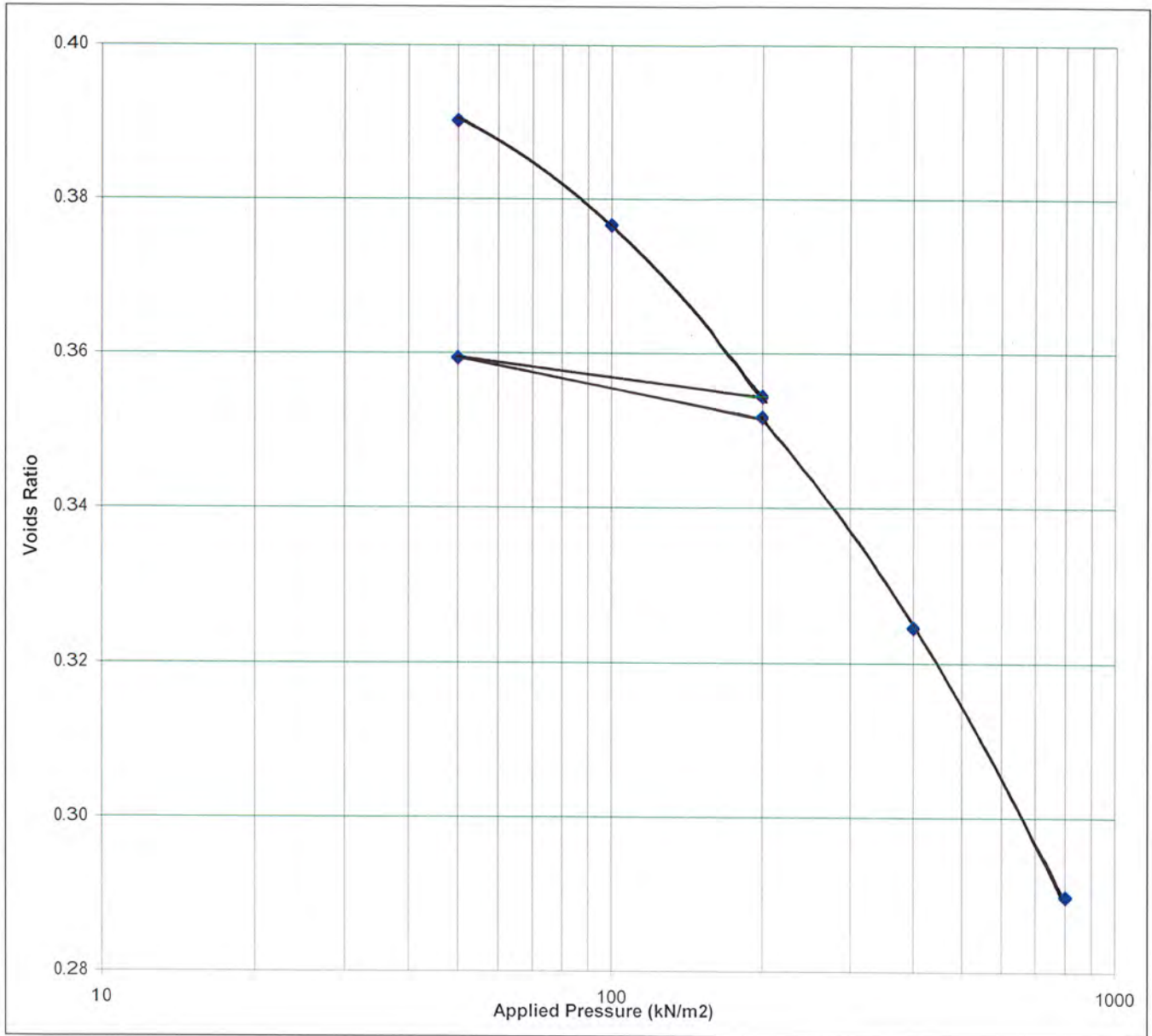
Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>		Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>	Page 1 of 2
	Date of Issue: 17/05/2021	Certificate No: 4322A/E	AEG Contract No: 4322A
			 1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5B

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No <b>BH SBC031</b>	Sample <b>U19</b>	Depth (m) <b>6.50m</b>	
Specimen Type <b>Undisturbed</b>	Orientation <b>Vertical</b>	Specific Depth (m) <b>6.53m</b>	



Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>	Client: <b>AMEY OW Limited</b>
--	-----------------------------------

	Signature:	Name: <b>M. SELKIRK</b>	Page 2 of 2	
	Date of Issue: <b>17/05/2021</b>	Certificate No: <b>4322A/E</b>	AEG Contract No: <b>4322A</b>	



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, D  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	<b>BH SBC032</b>	Sample	<b>U9</b>	Depth (m)	<b>2.00m</b>
Specimen Type	<b>Undisturbed</b>	Orientation	<b>Vertical</b>	Specific Depth (m)	<b>2.05m</b>
	INITIAL	FINAL			
Height	18.9	17.9	mm	Particle Density (Assumed)	2.70
Diameter	74.94	74.94	mm	Degree of Saturation (%)	88.6
Moisture Content	15.9	15.5	%	Test Duration (Days)	6
Wet Density	2.11	2.23	Mg/m <sup>3</sup>	Date Tested	06/05/2021
Dry Density	1.82	1.93	Mg/m <sup>3</sup>		

Square Root of Time Fitting Method				
Pressure Range kN/m <sup>2</sup>	Mv m <sup>2</sup> /MN	Cv m <sup>2</sup> /yr	Temp C	Voids Ratio
Initial				0.485
0 - 25	0.351	.	19	0.471
25 - 50	0.284	10.07	19	0.461
50 - 100	0.213	8.63	20	0.446
100 - 200	0.152	9.27	20	0.424
200 - 400	0.095	8.77	21	0.397
400 - 100	0.012	Swelling	21	0.401

For sample description please refer to the Laboratory Sample Description Sheet.

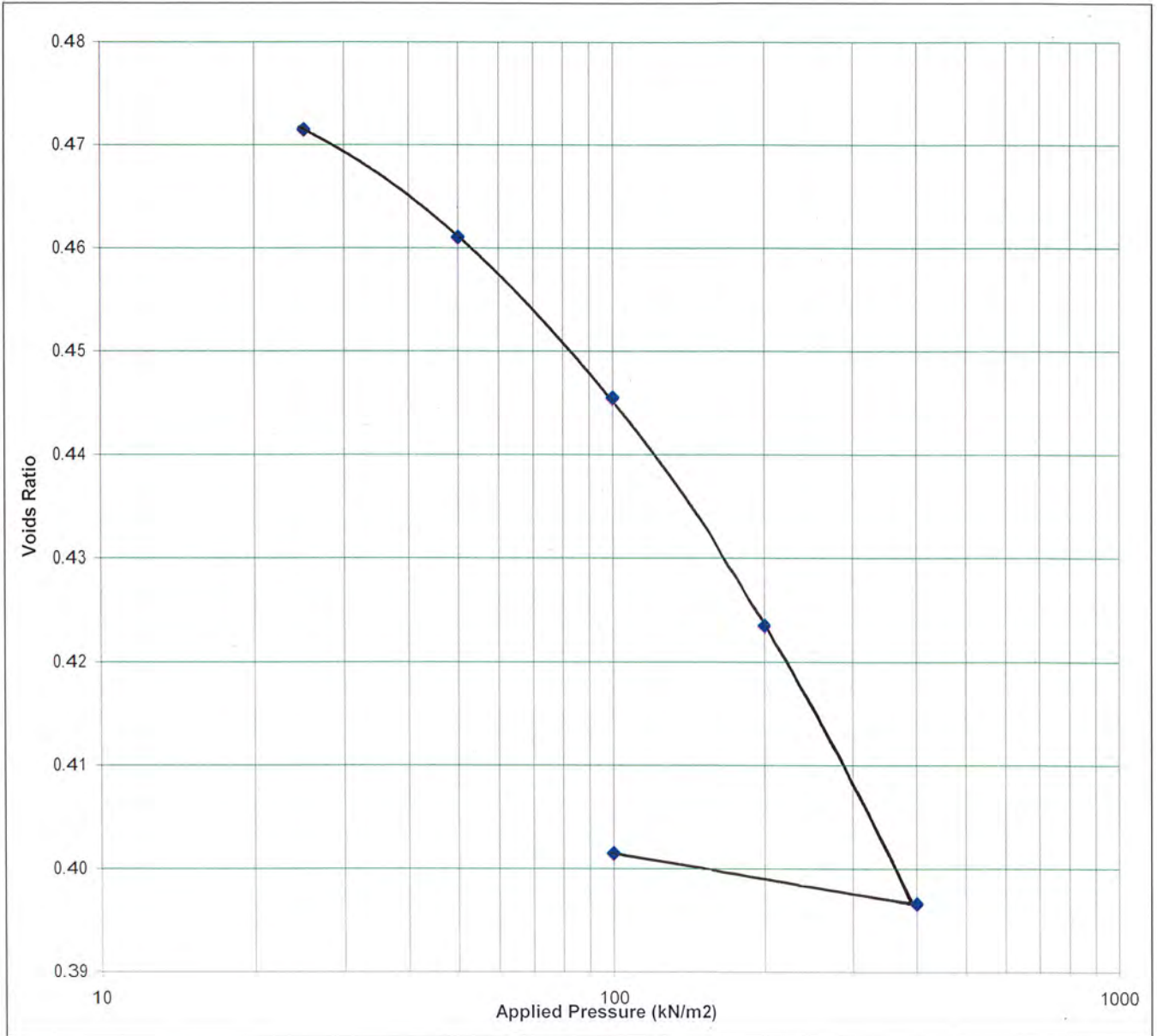
Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>			Client: <b>AMEY OW Limited</b>	
	Signed: 	Name: <b>M. SELKIRK</b>		Page 1 of 2
	Date of Issue: 17/05/2021	Certificate No: 4322A/D	AEG Contract No: 4322A	
				 1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## ONE DIMENSIONAL CONSOLIDATION PROPERTIES BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No <b>BH SBC032</b>	Sample <b>U9</b>	Depth (m) <b>2.00m</b>
Specimen Type <b>Undisturbed</b>	Orientation <b>Vertical</b>	Specific Depth (m) <b>2.05m</b>



Contract Title: <b>A66 North Trans Pennine Scheme C Section 9</b>	Client: <b>AMEY OW Limited</b>
--	-----------------------------------

	Signed:	Name: <b>M. SELKIRK</b>	Page 2 of 2	
	Date of Issue: <b>17/05/2021</b>	Certificate No: <b>4322A/D</b>	AEG Contract No: <b>4322A</b>	



## Shear Strength by Hand Vane



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 1JH  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL



## DETERMINATION OF SHEAR STRENGTH BY HAND VANE

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Vane Shear Strength (kPa)	Remarks
BH SBC011	3.30	U13	3.30	53	
BH SBC011	3.30	U13	3.75	28	
BH SBC011	6.20	U20	6.20	232	
BH SBC011	6.20	U20	6.65	296	
BH SBC012	1.30	U10	1.30	62	
BH SBC012	1.30	U10	1.75	60	
BH SBC012	9.00	U35	9.00	82	
BH SBC012	9.00	U35	9.45	121	
BH SBC013	1.50	U5	1.50	49	
BH SBC013	1.50	U5	1.95	51	
BH SBC013	5.50	U19	5.50	9	
BH SBC013	5.50	U19	5.95	65	
BH SBC014A	3.50	U11	3.50	71	
BH SBC014A	3.50	U11	3.95	56	
BH SBC014A	15.30	C29	15.30	130	>130
BH SBC014A	16.30	C30	16.30	130	>130
BH SBC015	3.50	U10	3.50	47	
BH SBC015	7.00	U20	7.00	101	
BH SBC015	7.00	U20	7.45	41	
BH SBC015	10.00	U28	10.00	18	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signe	Name :- <span style="border: 2px solid red; padding: 5px; font-weight: bold;">M. SELKIRK</span>	Page 1 of 4	
	Date of issue :- 07/09/2021	Certificate No :- HSV/4322A/1	AEG Contract No. :- <b>4322A</b>	



# ALLIED EXPLORATION & GEOTECHNICS LIMITED


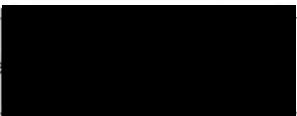

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fall, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - T

## DETERMINATION OF SHEAR STRENGTH BY HAND VANE

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Vane Shear Strength (kPa)	Remarks
BH SBC015	10.00	U28	10.45	123	
BH SBC016	5.50	U15	5.50	84	
BH SBC016	5.50	U15	5.95	101	
BH SBC017	4.50	U14	4.50	109	
BH SBC017	4.50	U14	4.95	72	
BH SBC021	6.30	U23	6.30	59	
BH SBC021	6.30	U23	6.75	44	
BH SBC022	4.50	U15	4.50	55	
BH SBC022	4.50	U15	4.95	94	
BH SBC023A	1.20	U9	1.20	61	
BH SBC023A	1.20	U9	1.65	126	
BH SBC023A	4.30	U17	4.30	75	
BH SBC023A	4.30	U17	4.75	70	
BH SBC024	3.50	U12	3.50	13	
BH SBC024	3.50	U12	3.95	37	
BH SBC024	14.00	C30	14.00	130	>130
BH SBC024	20.00	C36	20.00	100	
BH SBC024	21.00	C37	21.00	108	
BH SBC024	23.00	C39	23.00	130	>130
BH SBC024	24.00	C40	24.00	130	>130

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <p style="text-align: center;">A66 North Trans Pennine Scheme C Section 9</p>	Client :- <p style="text-align: center;">AMEY OW Limited</p>
--	---

	Signe  Date of issue :- <p style="text-align: center;">07/09/2021</p>	Name :- <div style="text-align: center; border: 2px solid red; padding: 5px; font-weight: bold; font-size: 1.2em;">M. SELKIRK</div> Certificate No :- <p style="text-align: center;">HSV/4322A/2</p>	Page 2 of 4	
		AEG Contract No. :- <p style="font-weight: bold; font-size: 1.2em;">4322A</p>		

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Peilton Fell, Chester-le-Street, Co. Durham, DH2 2JL  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

## DETERMINATION OF SHEAR STRENGTH BY HAND VANE

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Vane Shear Strength (kPa)	Remarks
BH SBC025	8.00	C29	8.00	130	>130
BH SBC025	10.00	C31	10.00	130	>130
BH SBC025	13.00	C34	13.00	130	>130
BH SBC025	14.00	C35	14.00	123	
BH SBC025	15.00	C36	15.00	130	>130
BH SBC025	16.00	C37	16.00	130	>130
BH SBC025	17.00	C38	17.00	130	>130
BH SBC025	18.00	C39	18.00	130	>130
BH SBC025	21.00	C42	21.00	130	>130
BH SBC025	22.00	C43	22.00	130	>130
BH SBC025	24.00	C45	24.00	130	>130
BH SBC026	1.20	U7	1.20	46	
BH SBC026	1.20	U7	1.65	79	
BH SBC026	4.30	U18	4.30	98	
BH SBC026	4.30	U18	4.75	130	>130
BH SBC027	2.00	U12	2.00	228	
BH SBC027	2.00	U12	2.45	232	
BH SBC028	3.50	U14	3.50	89	
BH SBC028	3.50	U14	3.95	110	
BH SBC028	8.00	U23	8.00	91	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <p style="text-align: center; font-weight: bold;">A66 North Trans Pennine Scheme C Section 9</p>	Client :- <p style="text-align: center; font-weight: bold;">AMEY OW Limited</p>
---	--

<b>AEG</b>	Signe	Name :- <span style="border: 2px solid red; padding: 2px; font-weight: bold; color: red;">M. SELKIRK</span>	Page 3 of 4
<b>AEG</b>	Date of issue :- <p style="text-align: center;">07/09/2021</p>	Certificate No :- <p style="text-align: center;">HSV/4322A/3</p>	AEG Contract No. :- <p style="text-align: center; font-weight: bold;">4322A</p>





# ALLIED EXPLORATION & GEOTECHNICS LIMITED


Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## DETERMINATION OF SHEAR STRENGTH BY HAND VANE

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Vane Shear Strength (kPa)	Remarks
BH SBC028	8.00	U23	8.45	101	
BH SBC031	2.00	U9	2.00	42	
BH SBC031	2.00	U9	2.45	92	
BH SBC031	12.50	U31	12.50	103	
BH SBC031	12.50	U31	12.95	113	
BH SBC032A	8.00	U9	8.00	33	
BH SBC032A	8.00	U9	8.45	90	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- <p style="text-align: center;">A66 North Trans Pennine Scheme C Section 9</p>	Client :- <p style="text-align: center;">AMEY OW Limited</p>
--	---

	Signed: [REDACTED]	Name :- <span style="border: 1px solid red; padding: 2px; font-weight: bold;">M. SELKIRK</span>	Page 4 of 4
	Date of issue :- <p style="text-align: center;">07/09/2021</p>	Certificate No :- <p style="text-align: center;">HSV/4322A/4</p>	AEG Contract No. :- <p style="text-align: center;">4322A</p>




# TERRA TEK

Site Investigation & Laboratory Services

Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No	<b>4322A</b>
Client	Allied Exploration & Geotechnical Limited		
Engineer	-		

Hole ID	Sample Ref & Sample Type	Depth (m)	Description	Hand Vane (kPa)			
				1	2	3	Average
BH SBC011	U20, U	6.2	<b>(Top of Specimen)</b> Stiff intact grey slightly sandy gravelly CLAY. Gravel is fine to coarse.	253	228	215	232
BH SBC011	U20, U	6.2	<b>(Bottom of Specimen)</b> Stiff intact grey slightly sandy gravelly CLAY. Gravel is fine to coarse.	296	296	296	296
BH SBC023A	U17, U	4.3	<b>(Top of Specimen)</b> Soft intact dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	68	74	82	75
BH SBC023A	U17, U	4.3	<b>(Bottom of Specimen)</b> Soft intact dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	59	63	87	70
BH SBC2027	U12, U	2	<b>(Top of Specimen)</b> Stiff intact dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse.	258	211	215	228
BH SBC2027	U12, U	2	<b>(Bottom of Specimen)</b> Stiff intact dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse.	237	247	213	232

Originator	Checked & Approved	<b>Shear Strength by Hand Vane Method (kPa)</b>	
HL	16/07/2021		



## Shear Strength by Direct Shear



# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC012

**Sample:** B32

**Depth:** 7.60 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.2	23.2	23.2
Initial Moisture Content	%	14.8	14.8	14.8
Initial Wet density	mg/m <sup>3</sup>	2.10	2.10	2.11
Initial Dry density	mg/m <sup>3</sup>	1.83	1.83	1.84
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	50	100	200
Height at end of Stage	mm	22.6	22.1	21.4
Duration	Day(s)	1.0	1.0	1.0

### SHEARING

Rate of Strain	mm/min	0.039	0.039	0.039
Peak Shear Stress	kPa	23.8	41.0	68.9
Displacement at Peak Stress	mm	2.45	3.22	3.82
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	16.2	15.5	14.8
Final Wet Density	mg/m <sup>3</sup>	2.18	2.21	2.29
Final Dry Density	mg/m <sup>3</sup>	1.88	1.92	2.00

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	10
Angle of Shearing Resistance phi 'r	Deg	17°

### RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

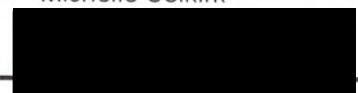
**DATE TESTED** 26/07/2021

**DATE OF ISSUE** 09/08/2021

**NAME**

Michelle Selkirk

**APPROVED BY**







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

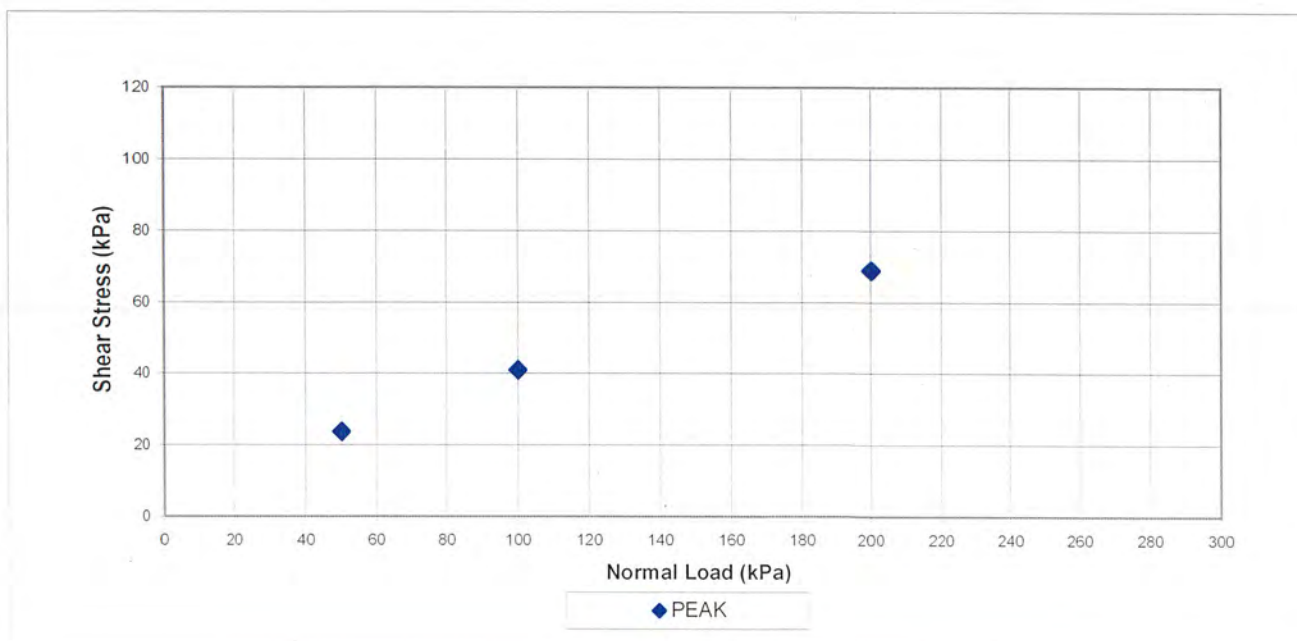
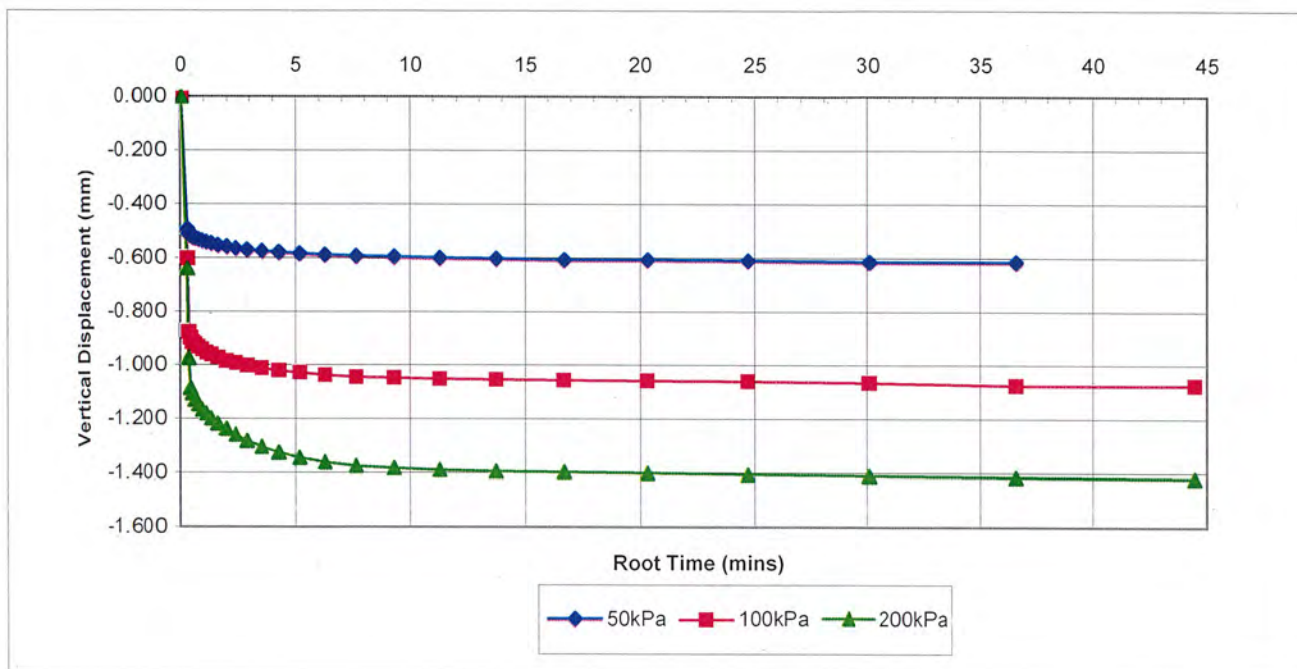
**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC012

**Sample:** B32

**Depth:** 7.60 m.





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co. Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

1367

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

**Borehole:** BH SBC012

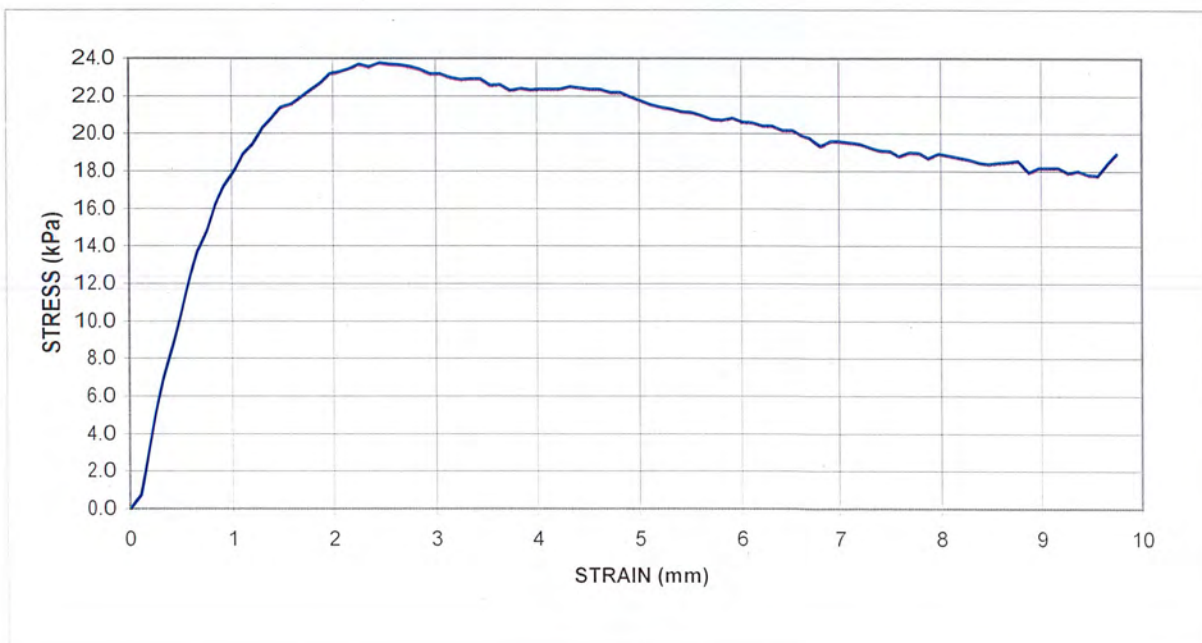
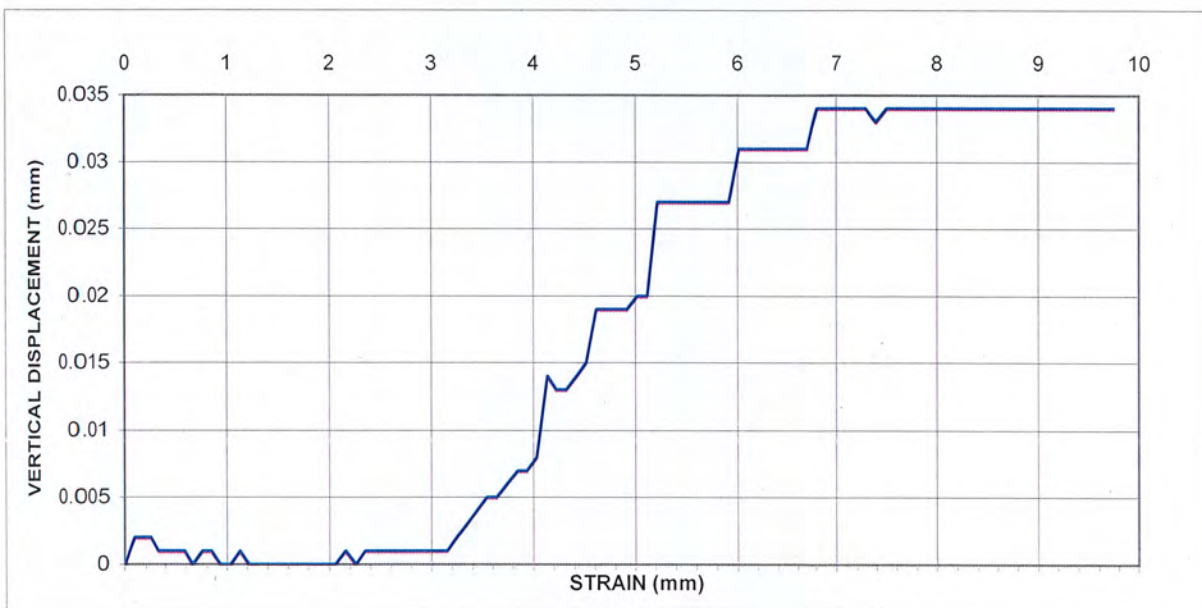
**Sample:** B32

**Depth:** 7.60 m.

**Stage Number** 1

**Pressure** 50 kPa

50 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

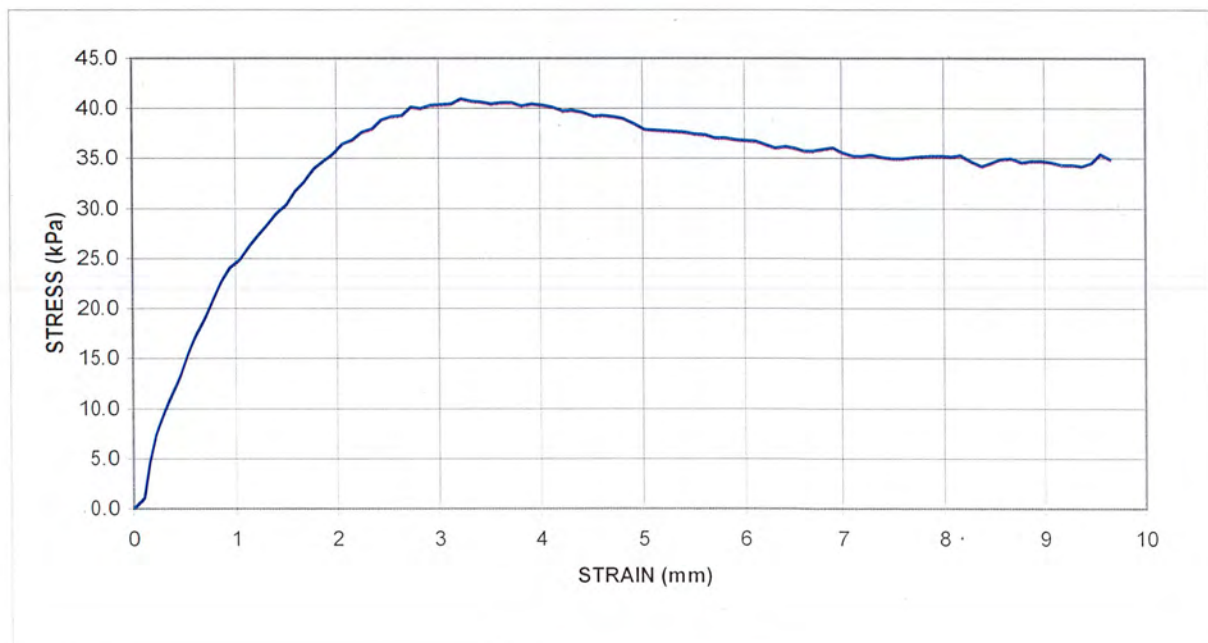
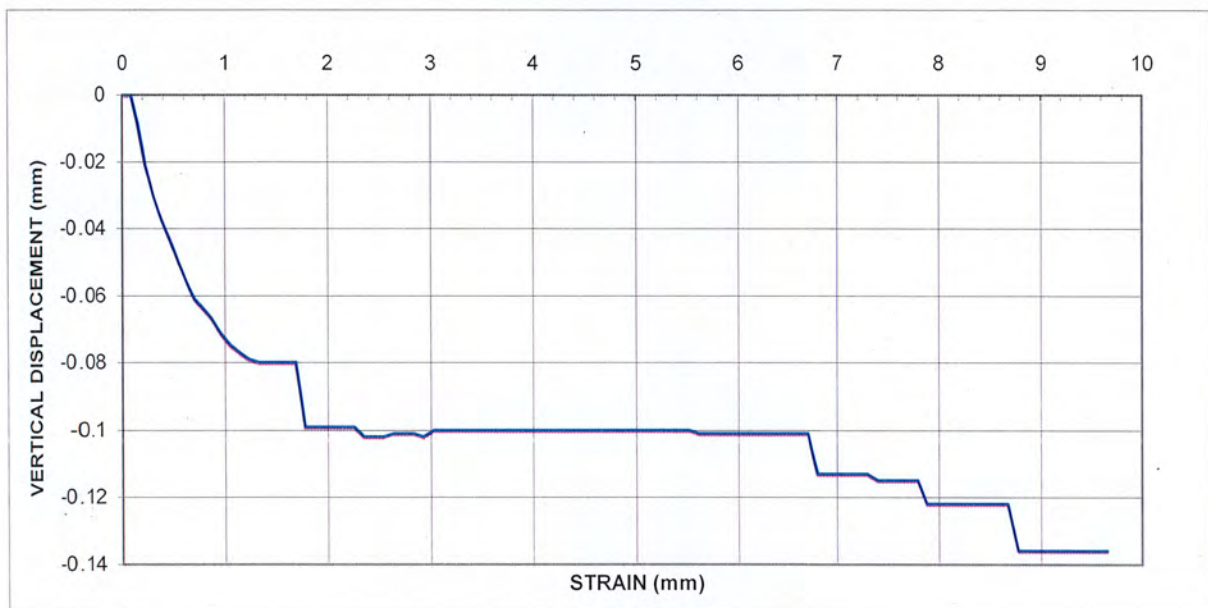
**Borehole:** BH SBC012

**Sample:** B32

**Depth:** 7.60 m.

**Stage Number** 2

**Pressure** 100 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

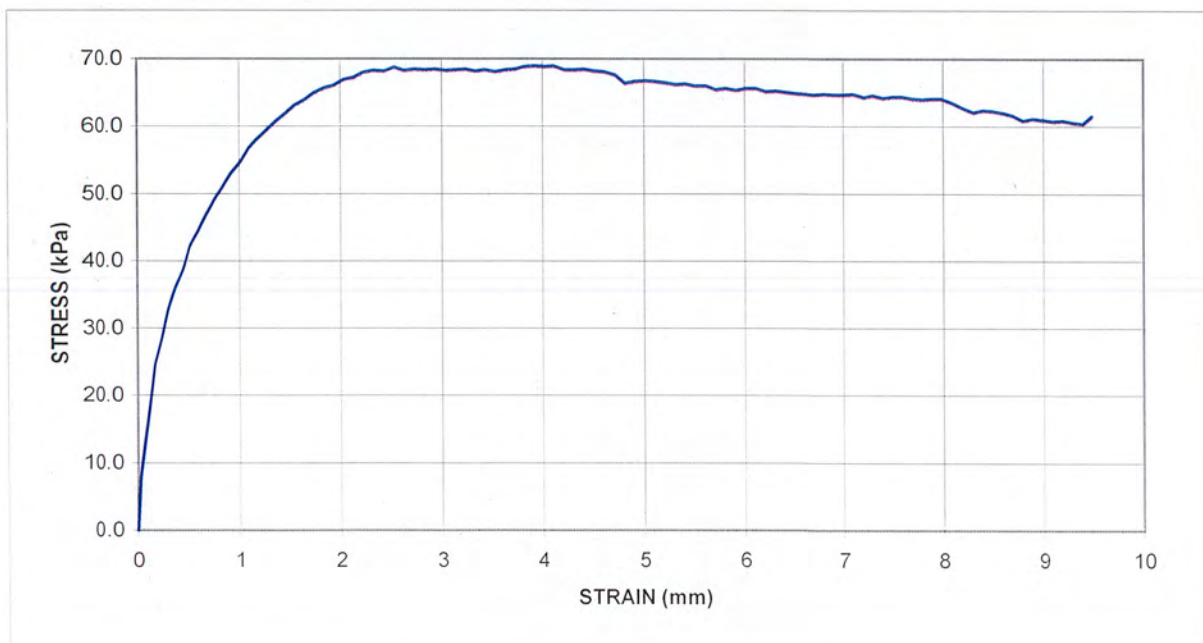
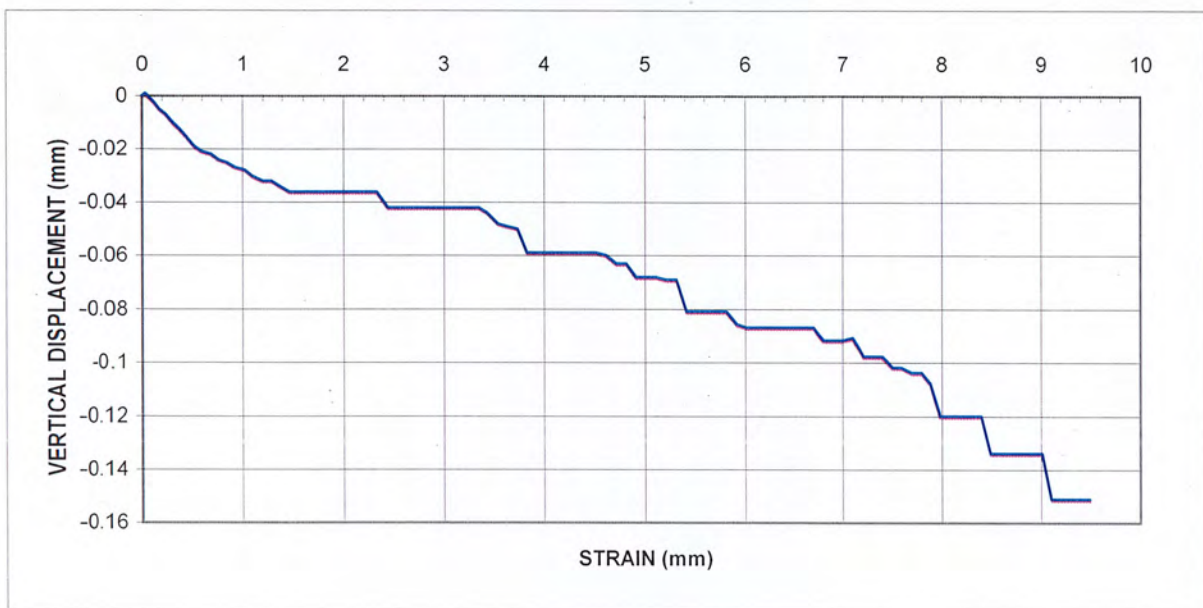
**Borehole:** BH SBC012

**Sample:** B32

**Depth:** 7.60 m.

**Stage Number** 3

**Pressure** 200 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** BH SBC020

**Sample:** B13

**Depth:** 2.50 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.2	23.2	23.2
Initial Moisture Content	%	22.2	22.2	22.2
Initial Wet density	mg/m <sup>3</sup>	2.02	2.00	2.01
Initial Dry density	mg/m <sup>3</sup>	1.65	1.64	1.65
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	25	50	100
Height at end of Stage	mm	22.7	22.0	21.7
Duration	Day(s)	0.5	0.5	0.5

### SHEARING

Rate of Strain	mm/min	0.025	0.025	0.026
Peak Shear Stress	kPa	9.2	22.4	47.6
Displacement at Peak Stress	mm	2.57	3.57	4.33
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	21.1	20.2	19.1
Final Wet Density	mg/m <sup>3</sup>	2.05	2.07	2.10
Final Dry Density	mg/m <sup>3</sup>	1.69	1.72	1.76

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	1
Angle of Shearing Resistance phi '	Deg	25°

### RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

**DATE TESTED** 05/08/2021  
**DATE OF ISSUE** 12/08/2021

**NAME** Michelle Selkirk  
**APPROVED BY** [REDACTED]



# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367

## Consolidated Drained Shear Box Test BS 1377 : PART 7 : 1990 Clause 4 (Specimen(s) Tested Submerged)



1367

**Site:** A66 North Trans Pennine Scheme C Section 9

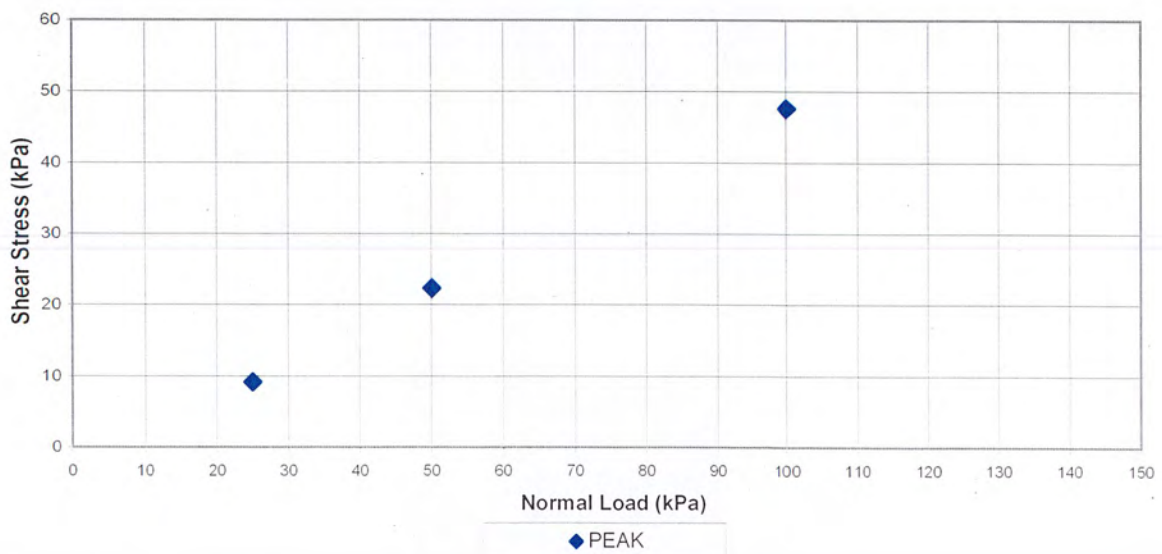
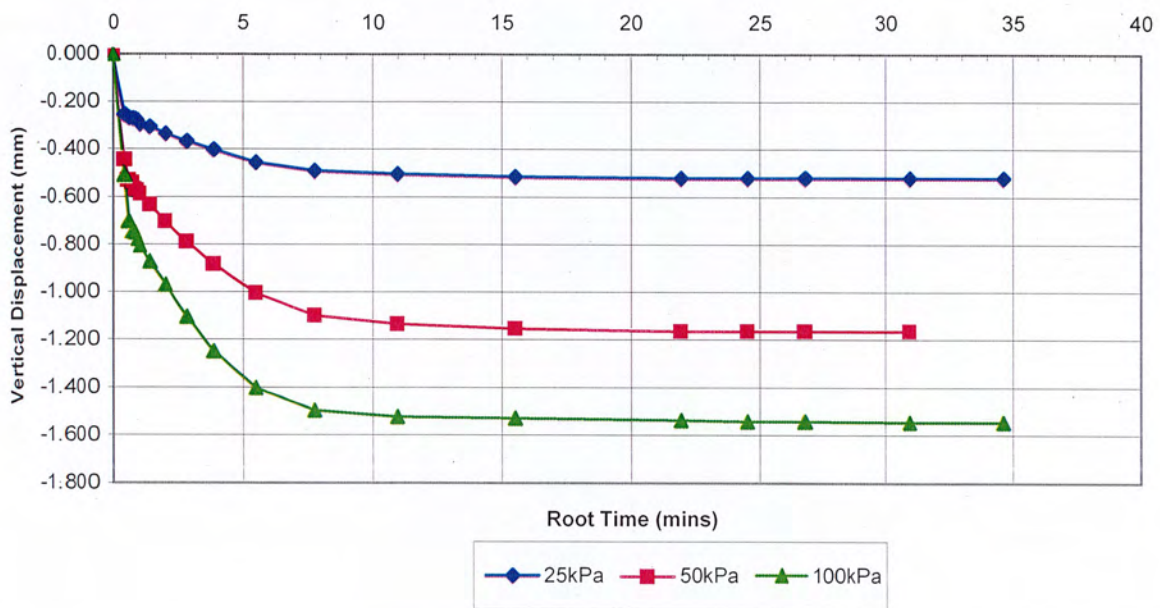
**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** BH SBC020

**Sample:** B13

**Depth:** 2.50 m.







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co.Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

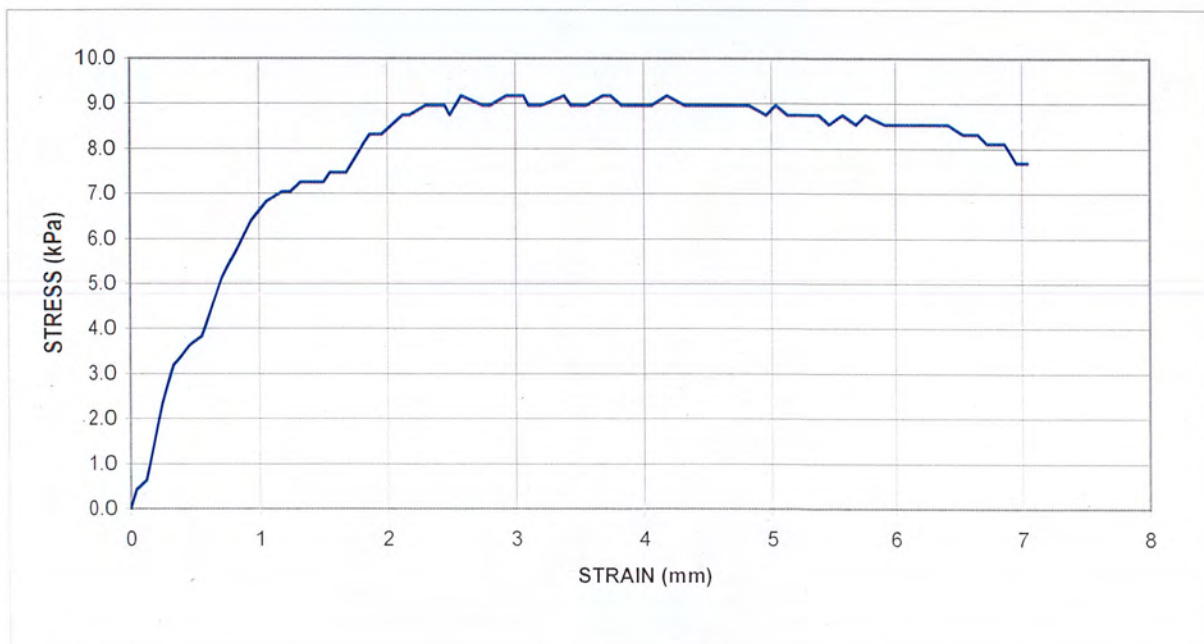
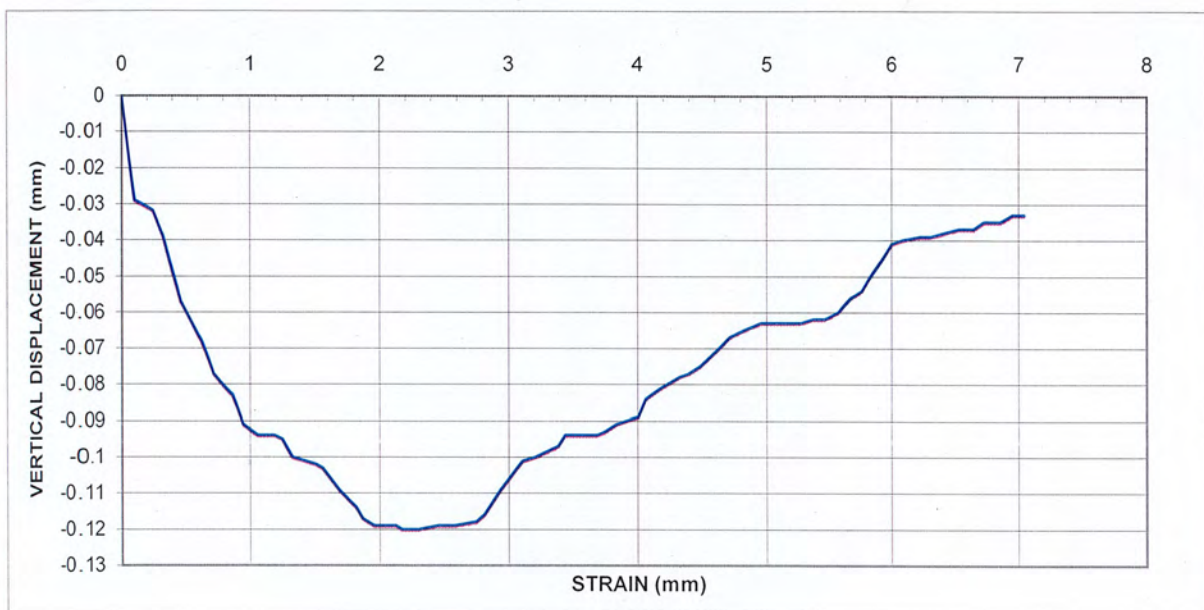
**Borehole:** BH SBC020

**Sample:** B13

**Depth:** 2.50 m.

**Stage Number** 1

**Pressure** 25 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co.Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

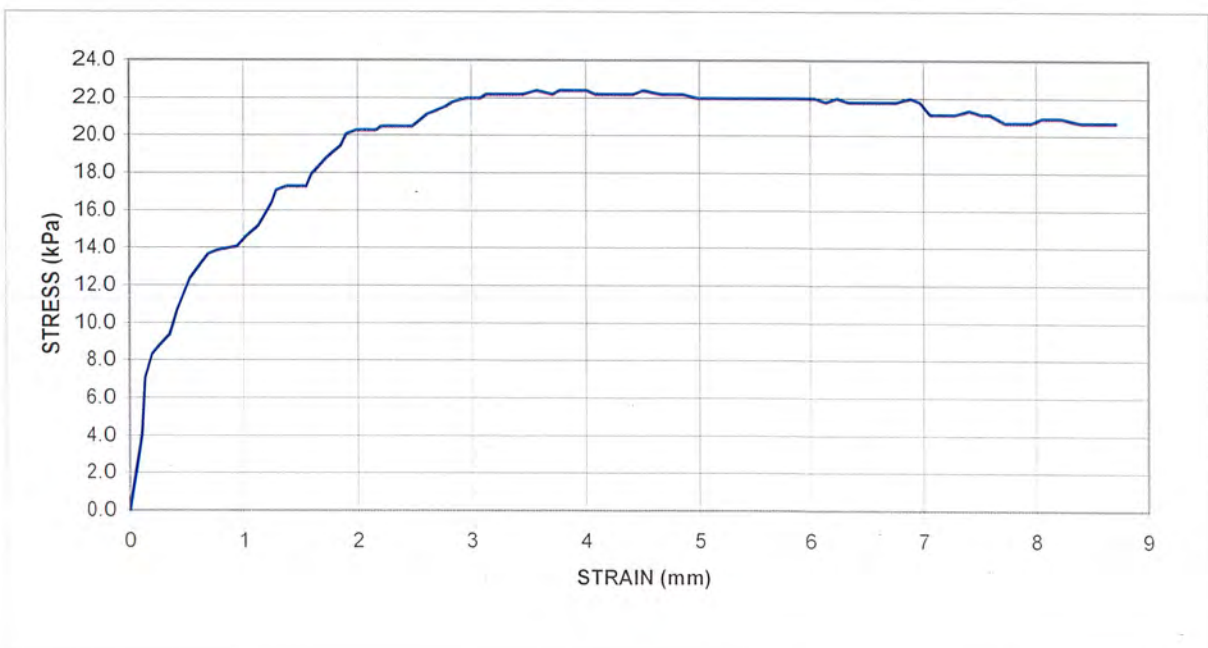
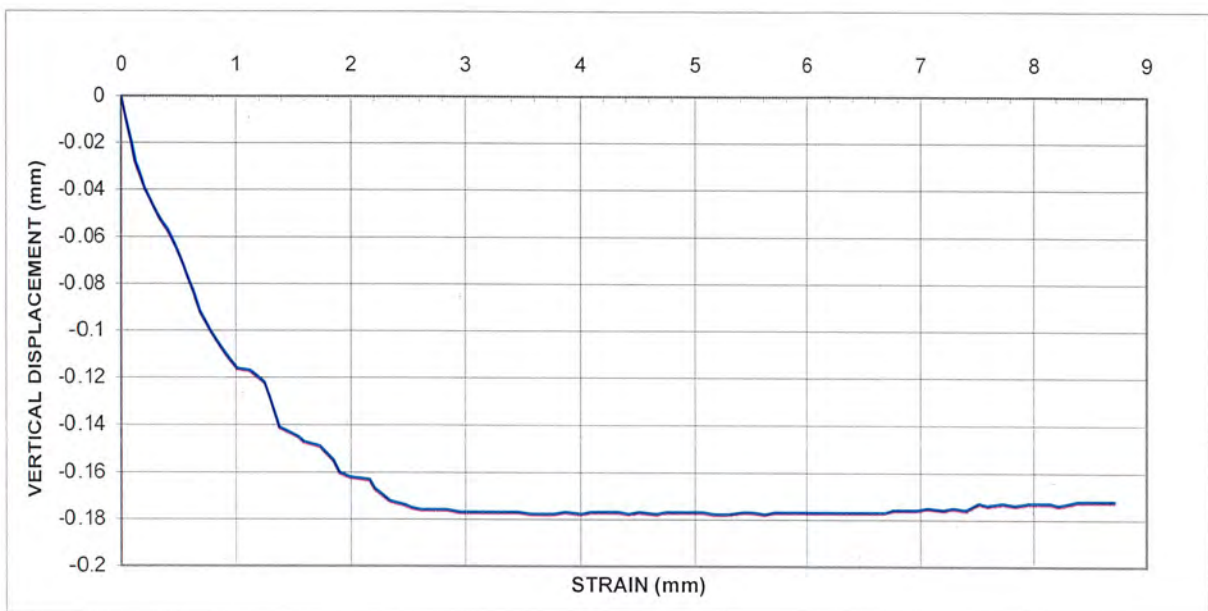
**Borehole:** BH SBC020

**Sample:** B13

**Depth:** 2.50 m.

**Stage Number** 2

**Pressure** 50 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co.Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

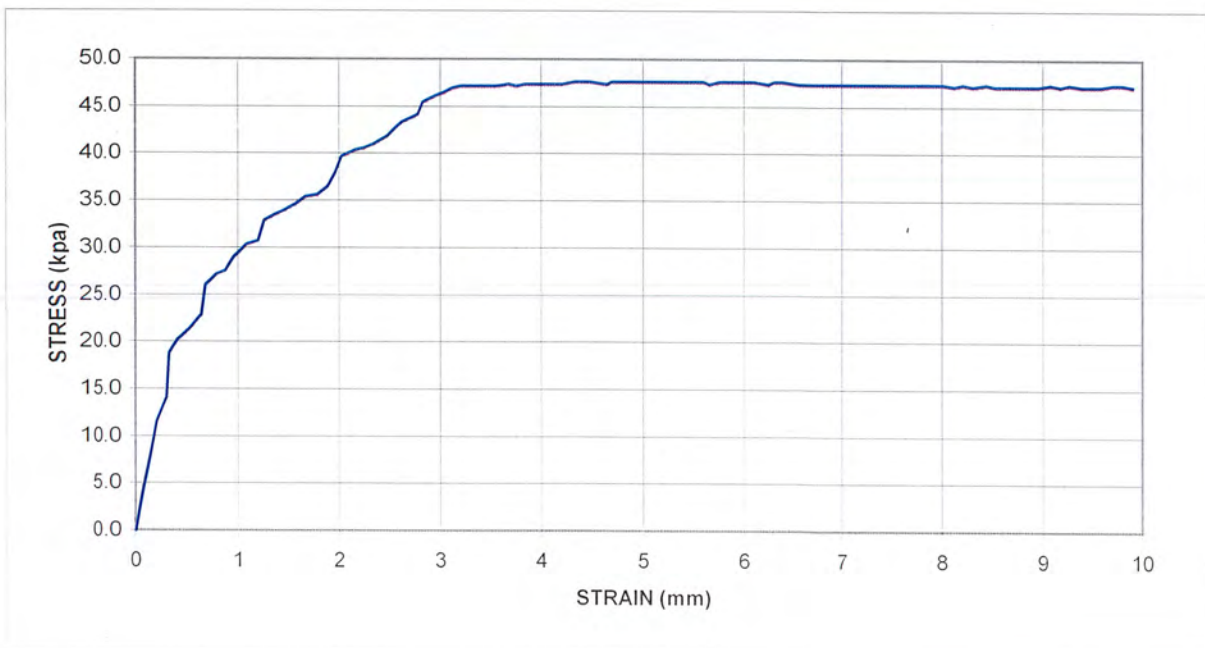
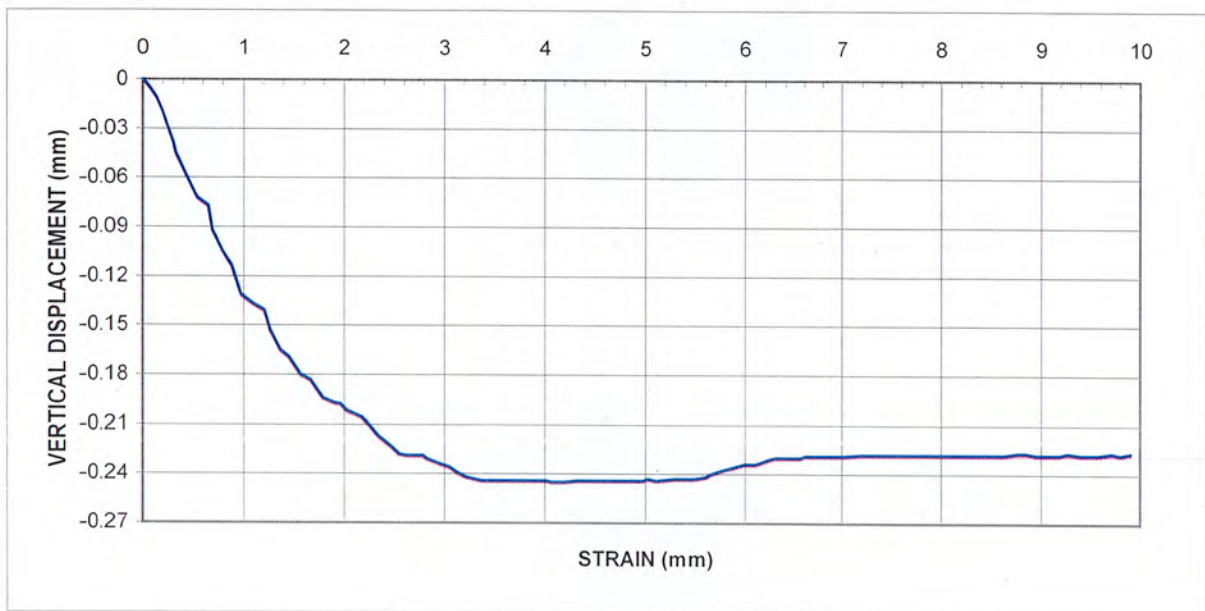
**Borehole:** BH SBC020

**Sample:** B13

**Depth:** 2.50 m.

**Stage Number** 3

**Pressure** 100 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC023A

**Sample:** B13

**Depth:** 2.20 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.2	23.1	23.2
Initial Moisture Content	%	15.2	15.2	15.2
Initial Wet density	mg/m <sup>3</sup>	2.10	2.09	2.11
Initial Dry density	mg/m <sup>3</sup>	1.82	1.81	1.83
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	25	50	100
Height at end of Stage	mm	22.9	22.4	22.2
Duration	Day(s)	1.0	1.0	1.0

### SHEARING

Rate of Strain	mm/min	0.021	0.021	0.022
Peak Shear Stress	kPa	12.9	25.0	43.7
Displacement at Peak Stress	mm	2.98	1.59	6.85
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	17.8	16.9	16.2
Final Wet Density	mg/m <sup>3</sup>	2.17	2.19	2.23
Final Dry Density	mg/m <sup>3</sup>	1.85	1.87	1.92

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	5
Angle of Shearing Resistance phi'	Deg	21°

### RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi'r	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

**DATE TESTED** 06/07/2021

**DATE OF ISSUE** 23/07/2021

**NAME**

Michelle Selkirk

**APPROVED BY**







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

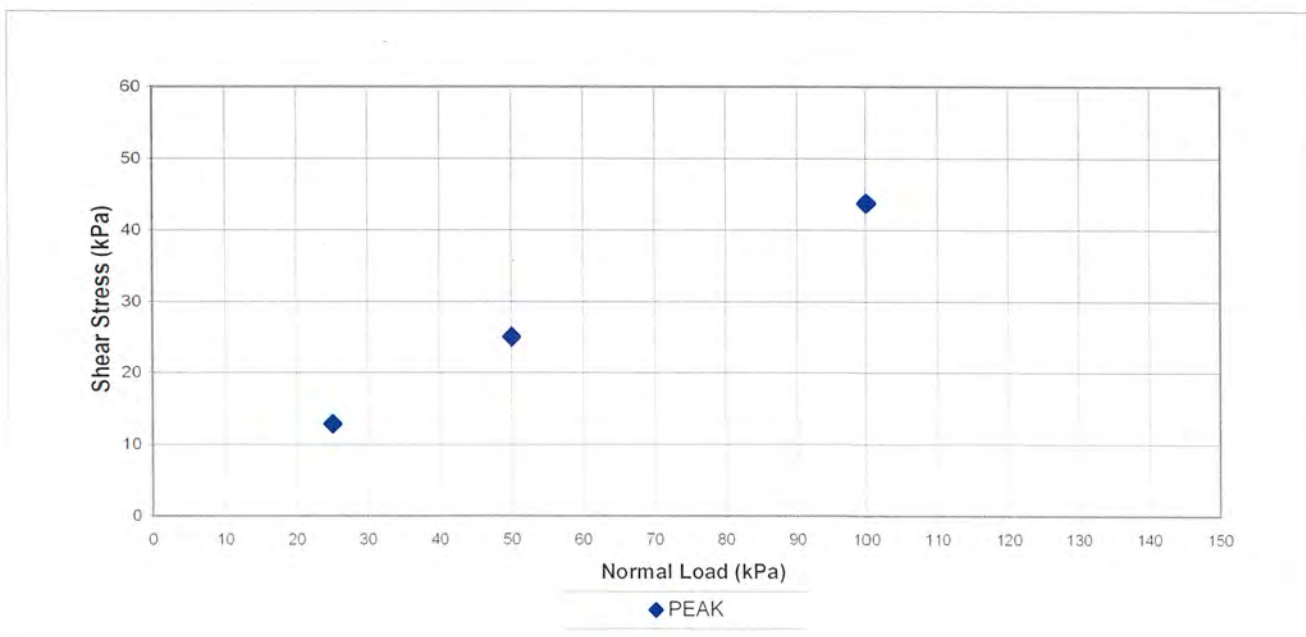
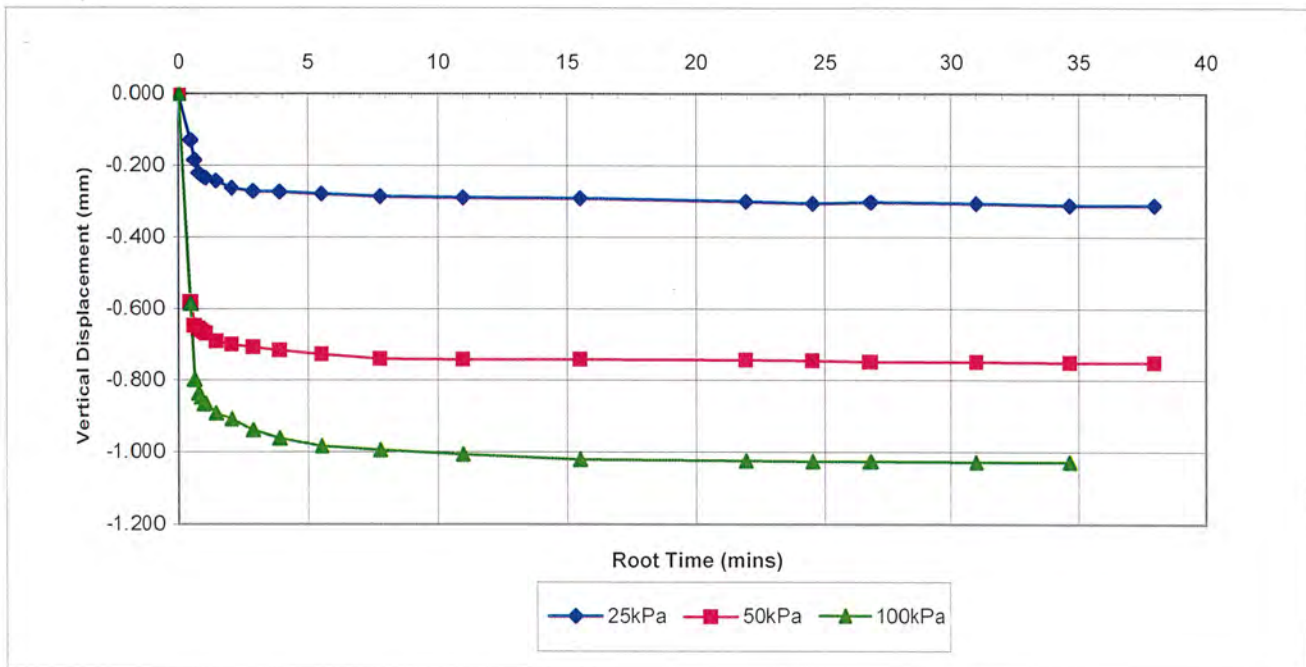
**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC023A

**Sample:** B13

**Depth:** 2.20 m.





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co.Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

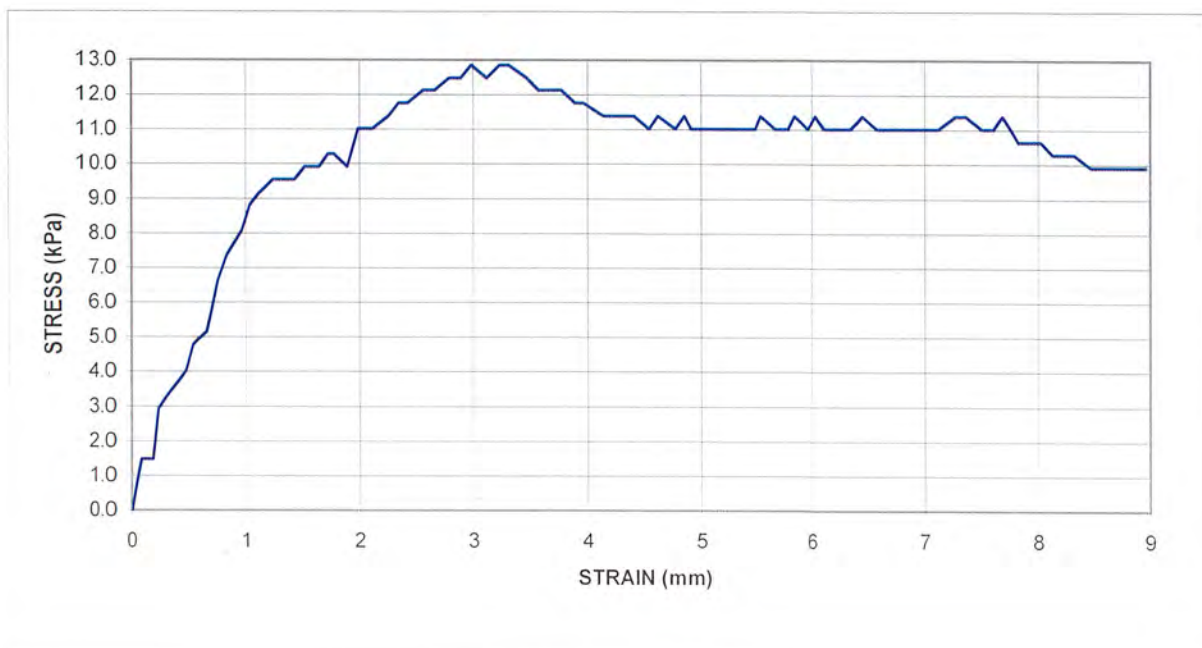
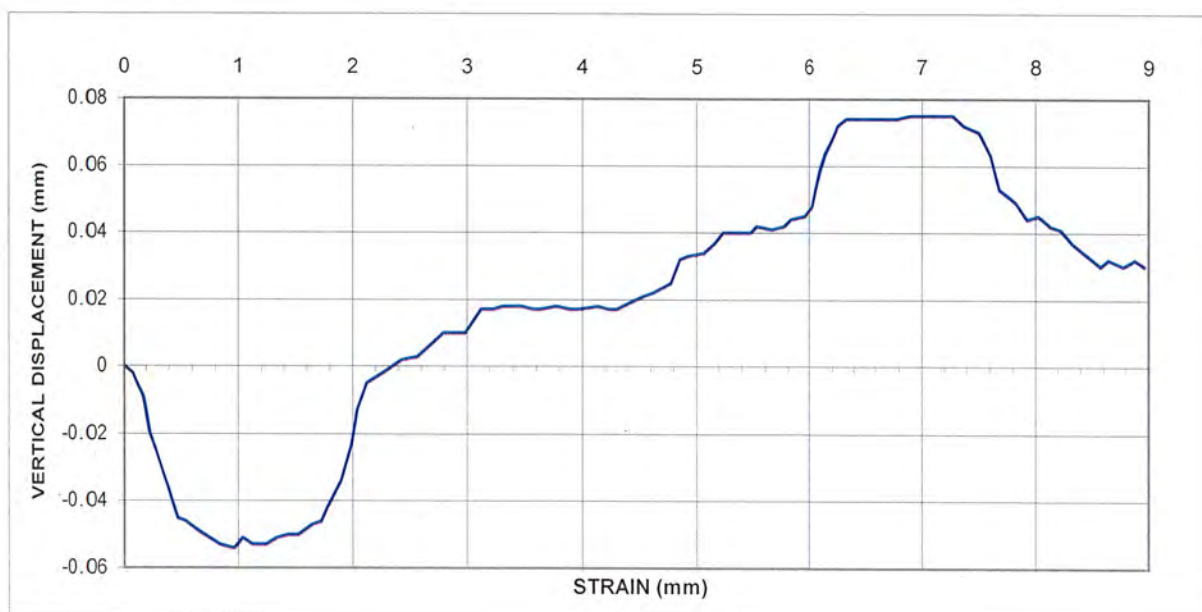
**Borehole:** BH SBC023A

**Sample:** B13

**Depth:** 2.20 m.

**Stage Number** 1

**Pressure** 25 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
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 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

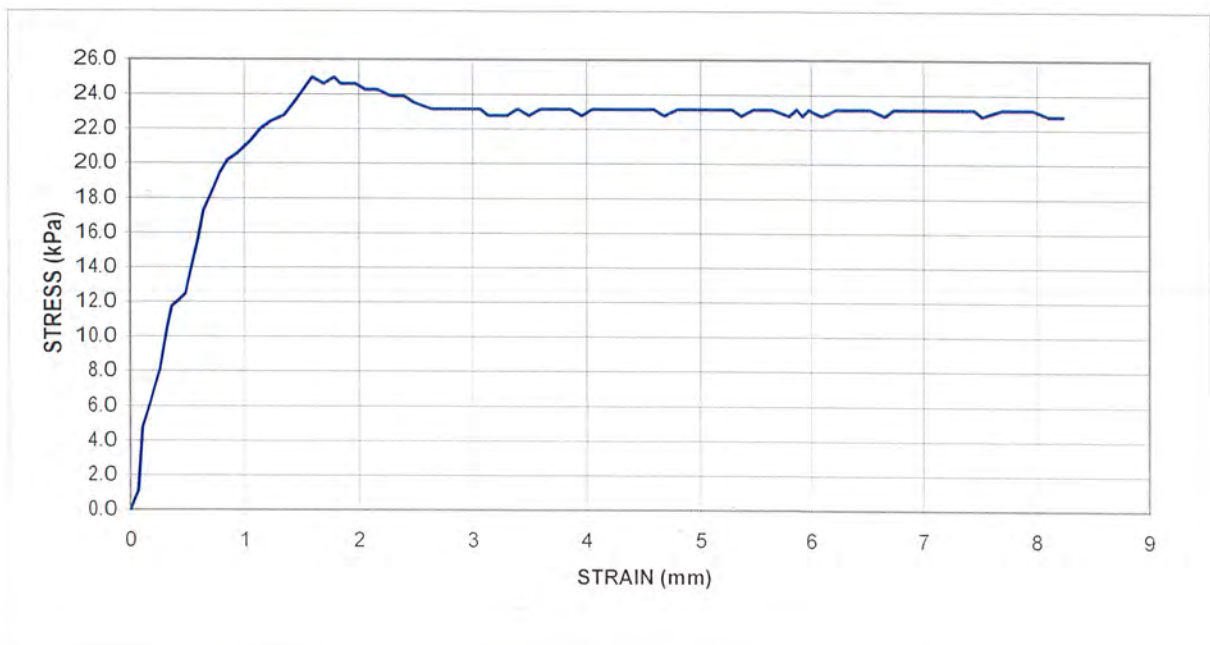
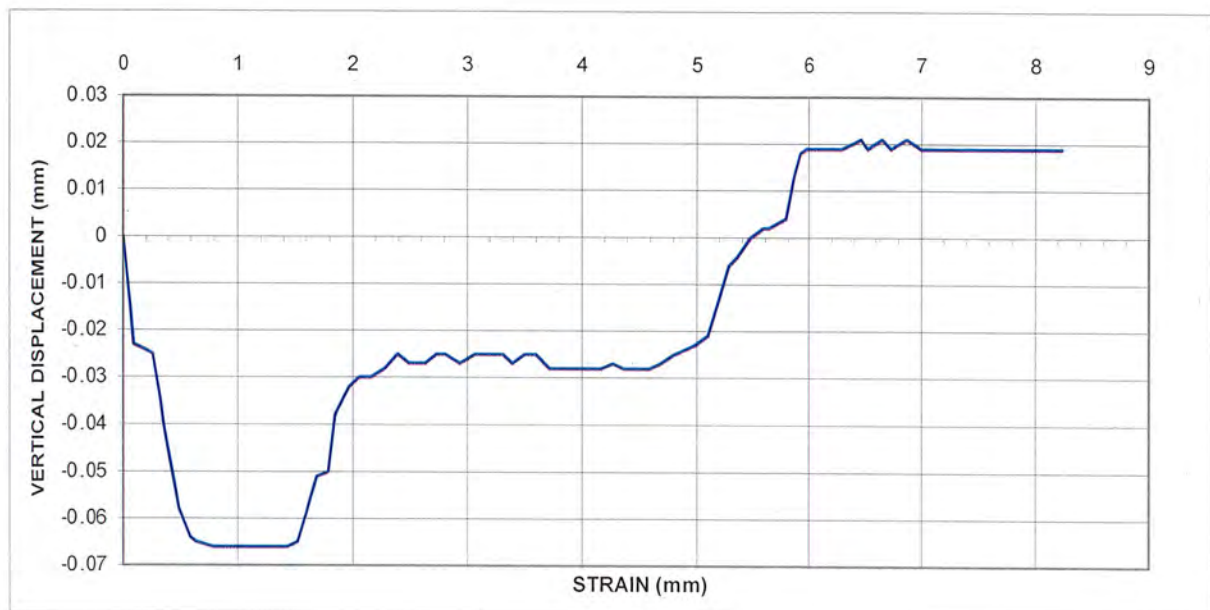
**Borehole:** BH SBC023A

**Sample:** B13

**Depth:** 2.20 m.

**Stage Number** 2

**Pressure** 50 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

1367

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

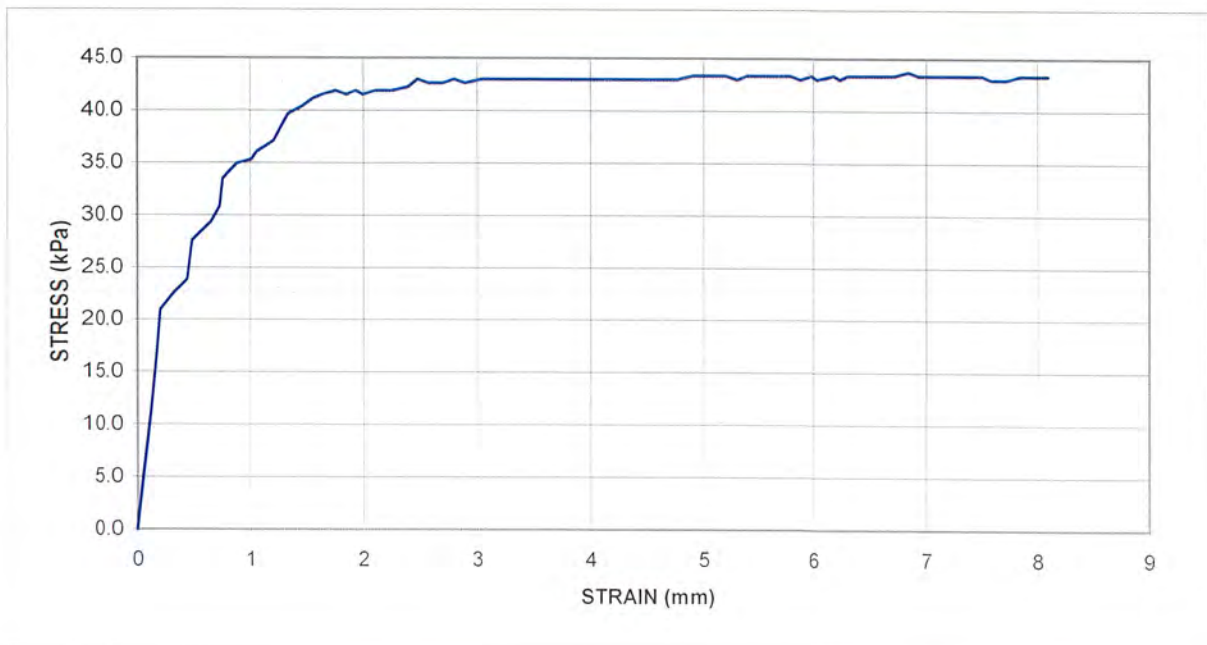
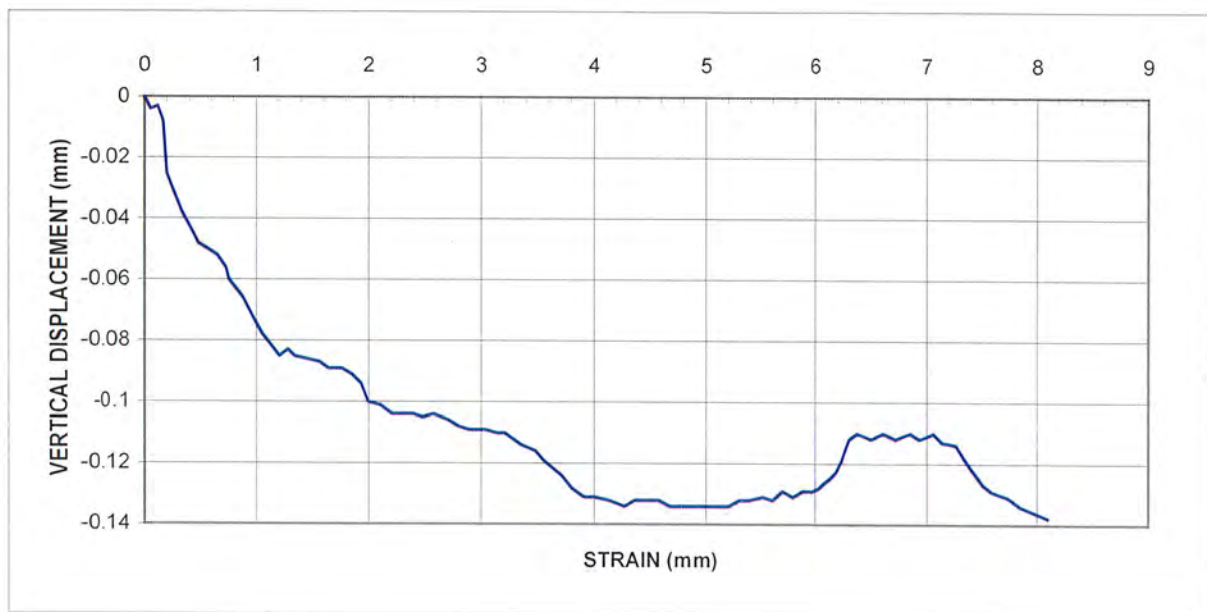
**Borehole:** BH SBC023A

**Sample:** B13

**Depth:** 2.20 m.

**Stage Number** 3

**Pressure** 100 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC024

**Sample:** B20

**Depth:** 5.50 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.2	23.2	23.2
Initial Moisture Content	%	13.1	13.1	13.1
Initial Wet density	mg/m <sup>3</sup>	2.13	2.15	2.12
Initial Dry density	mg/m <sup>3</sup>	1.88	1.90	1.87
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	50	100	200
Height at end of Stage	mm	22.6	22.0	21.4
Duration	Day(s)	1.0	1.0	1.0

### SHEARING

Rate of Strain	mm/min	0.077	0.074	0.072
Peak Shear Stress	kPa	23.5	45.9	90.0
Displacement at Peak Stress	mm	3.14	3.50	4.07
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	15.2	14.1	13.9
Final Wet Density	mg/m <sup>3</sup>	2.22	2.28	2.31
Final Dry Density	mg/m <sup>3</sup>	1.93	2.00	2.03

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion $C'$	kPa	2
Angle of Shearing Resistance $\phi'$	Deg	23°

### RESIDUAL PARAMETERS

Apparent Cohesion $C'$	kPa	N/A
Angle of Shearing Resistance $\phi'$	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

**DATE TESTED** 27/07/2021

**DATE OF ISSUE** 09/08/2021

**NAME**

Michelle Selkirk

**APPROVED BY**





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

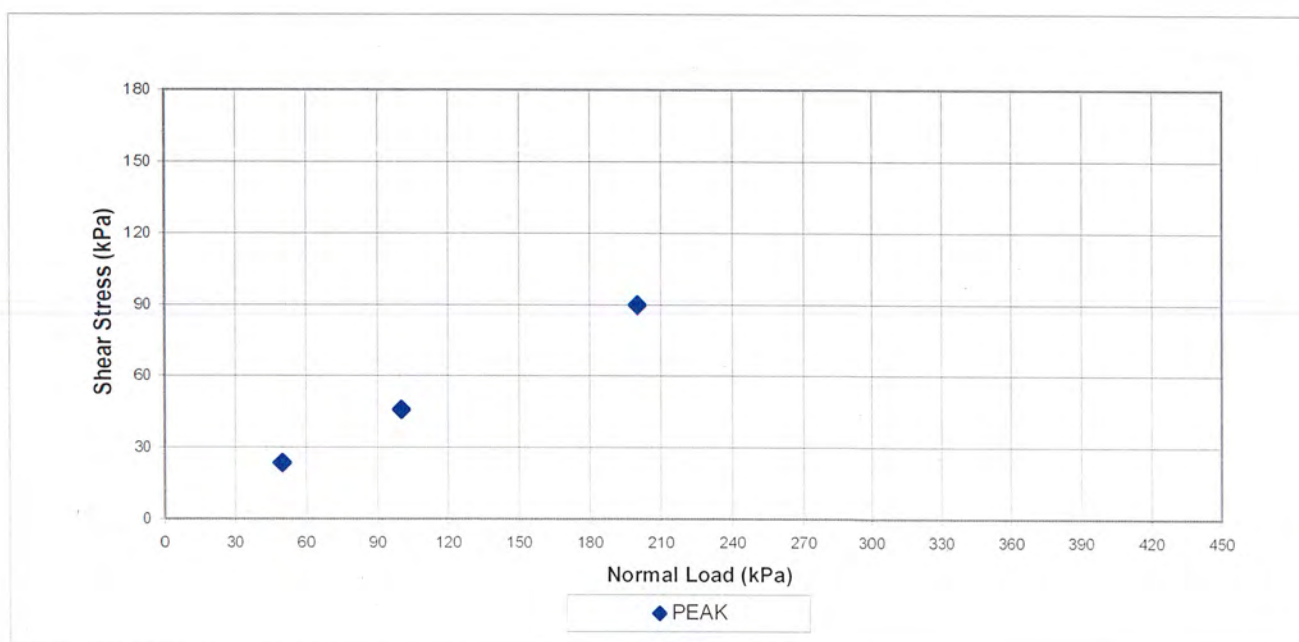
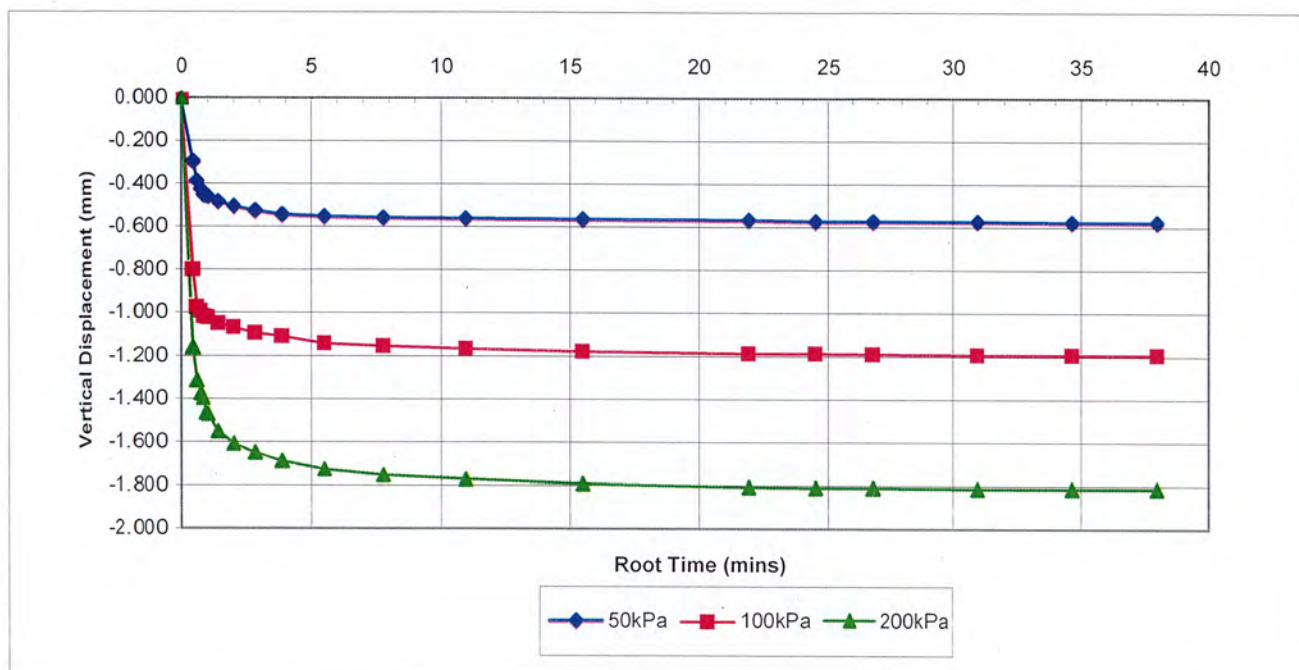
**Client:** AMEY OW Limited

**Job No.** 4322A

**Borehole:** BH SBC024

**Sample:** B20

**Depth:** 5.50 m.







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

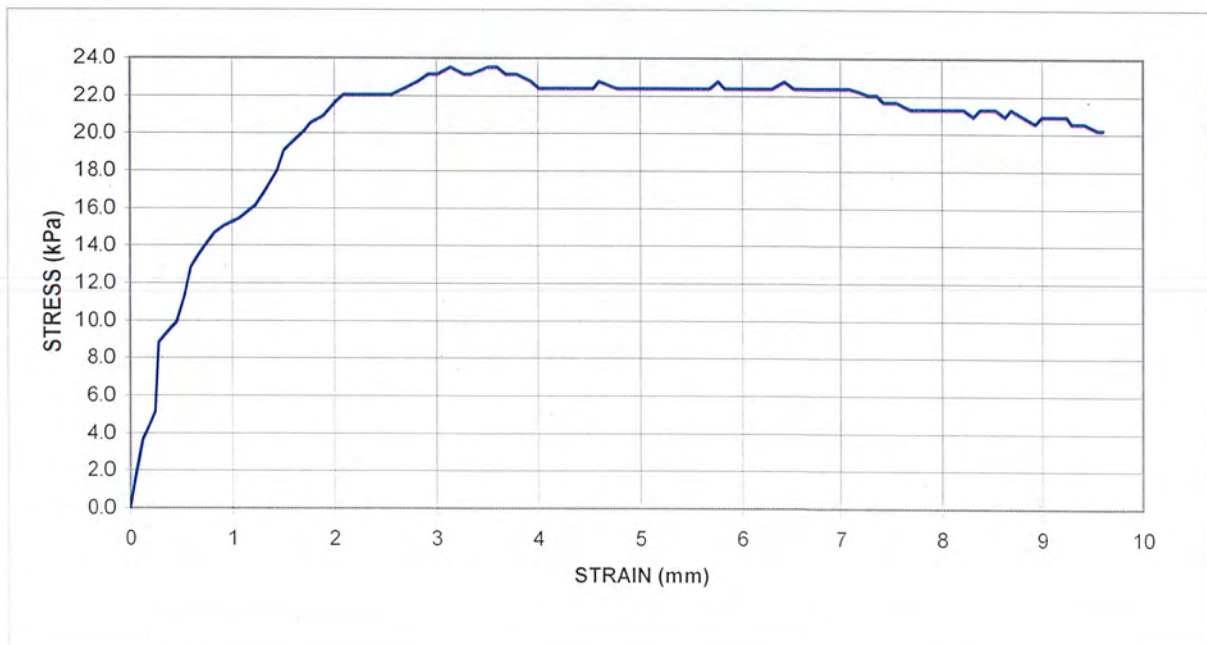
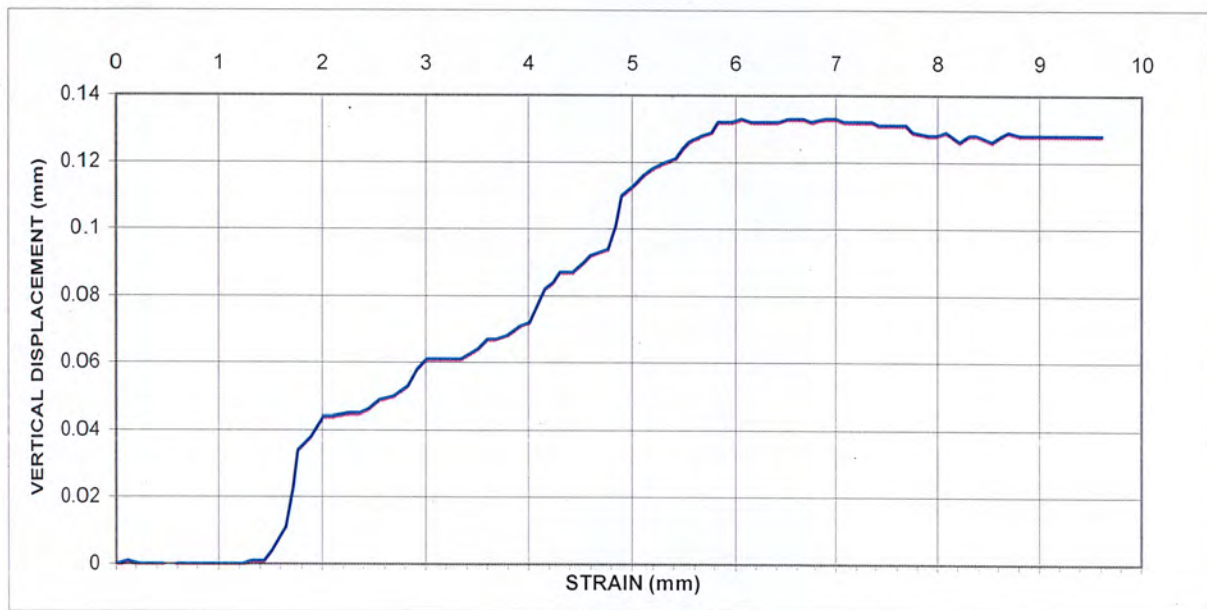
**Borehole:** 3H SBC024

**Sample:** B20

**Depth:** 5.50 m.

**Stage Number** 1

**Pressure** 50 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

**Borehole:** 3H SBC024

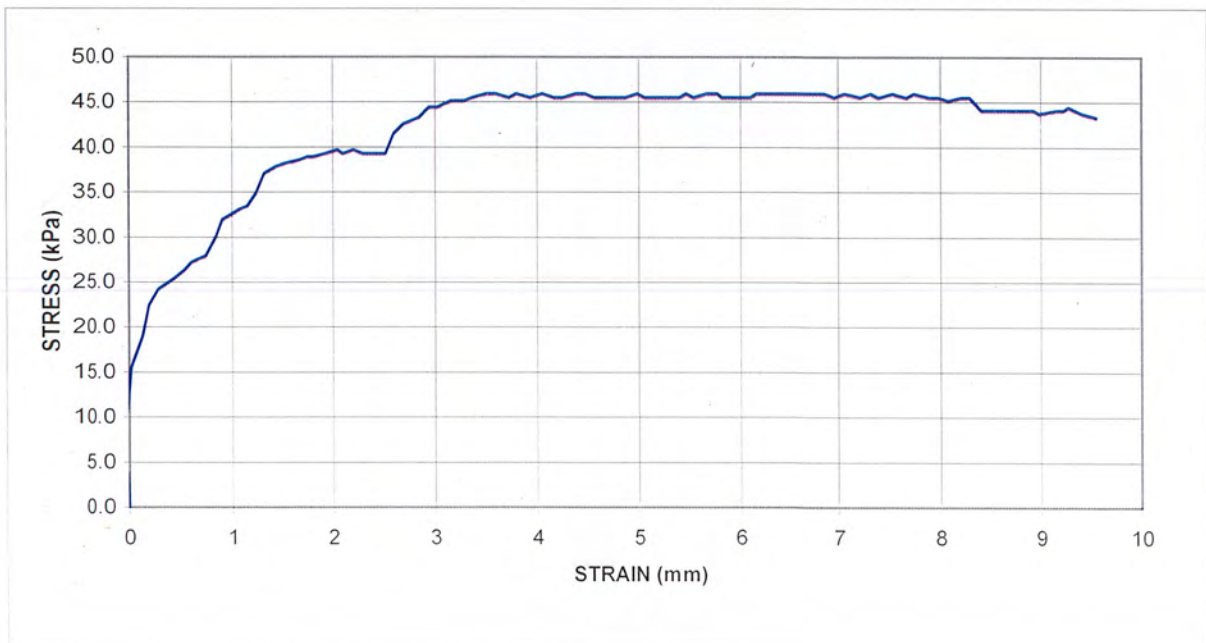
**Sample:** B20

**Depth:** 5.50 m.

**Stage Number** 2

**Pressure** 100 kPa

100 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co. Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

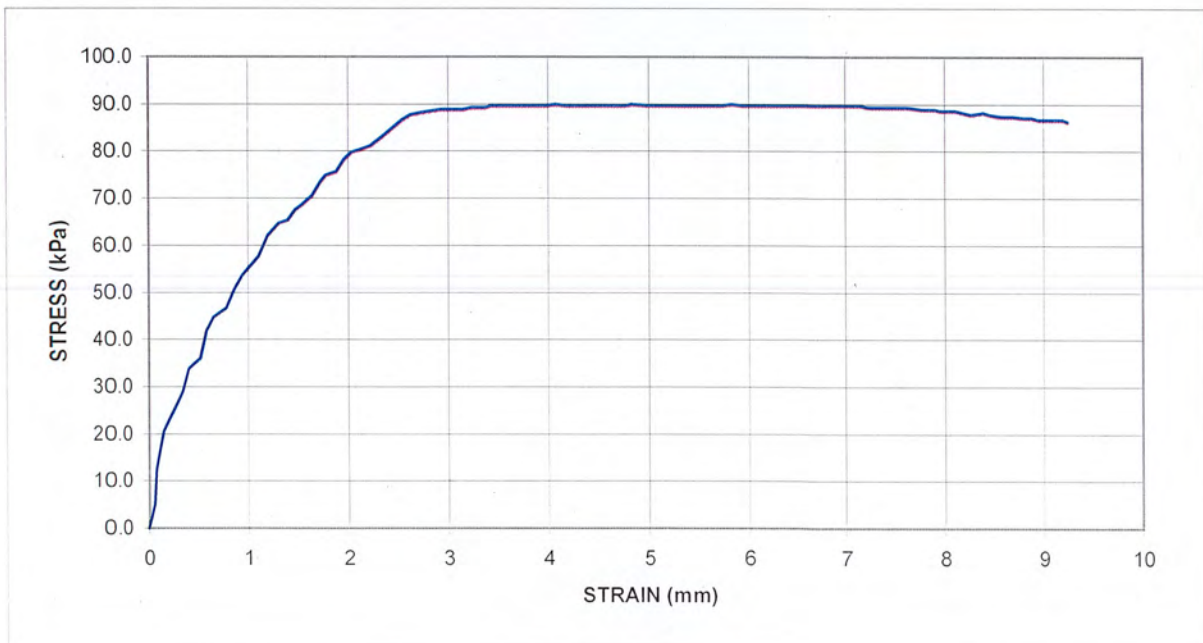
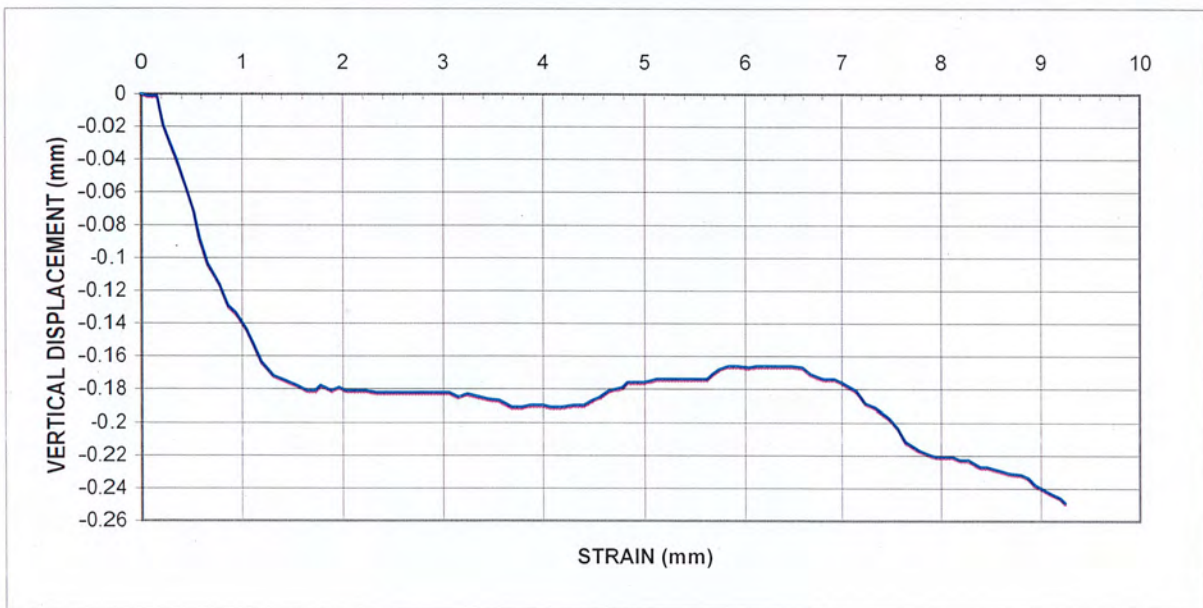
**Borehole:** 3H SBC024

**Sample:** B20

**Depth:** 5.50 m.

**Stage Number** 3

**Pressure** 200 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** TP SBC012A

**Sample:** B13

**Depth:** 4.00 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.2	23.2	23.2
Initial Moisture Content	%	13.7	13.7	13.7
Initial Wet density	mg/m <sup>3</sup>	2.15	2.14	2.15
Initial Dry density	mg/m <sup>3</sup>	1.89	1.89	1.89
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	40	80	120
Height at end of Stage	mm	23.0	22.8	22.6
Duration	Day(s)	0.5	0.5	1.0

### SHEARING

Rate of Strain	mm/min	0.038	0.038	0.038
Peak Shear Stress	kPa	38.0	59.3	85.8
Displacement at Peak Stress	mm	1.71	2.02	2.23
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	15.7	15.4	15.1
Final Wet Density	mg/m <sup>3</sup>	2.21	2.22	2.23
Final Dry Density	mg/m <sup>3</sup>	1.91	1.92	1.94

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	13
Angle of Shearing Resistance phi 'r	Deg	31°

### RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi 'r	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

**DATE TESTED** 14/07/2021

**DATE OF ISSUE** 29/07/2021

**NAME**

Michelle Selkirk

**APPROVED BY**







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

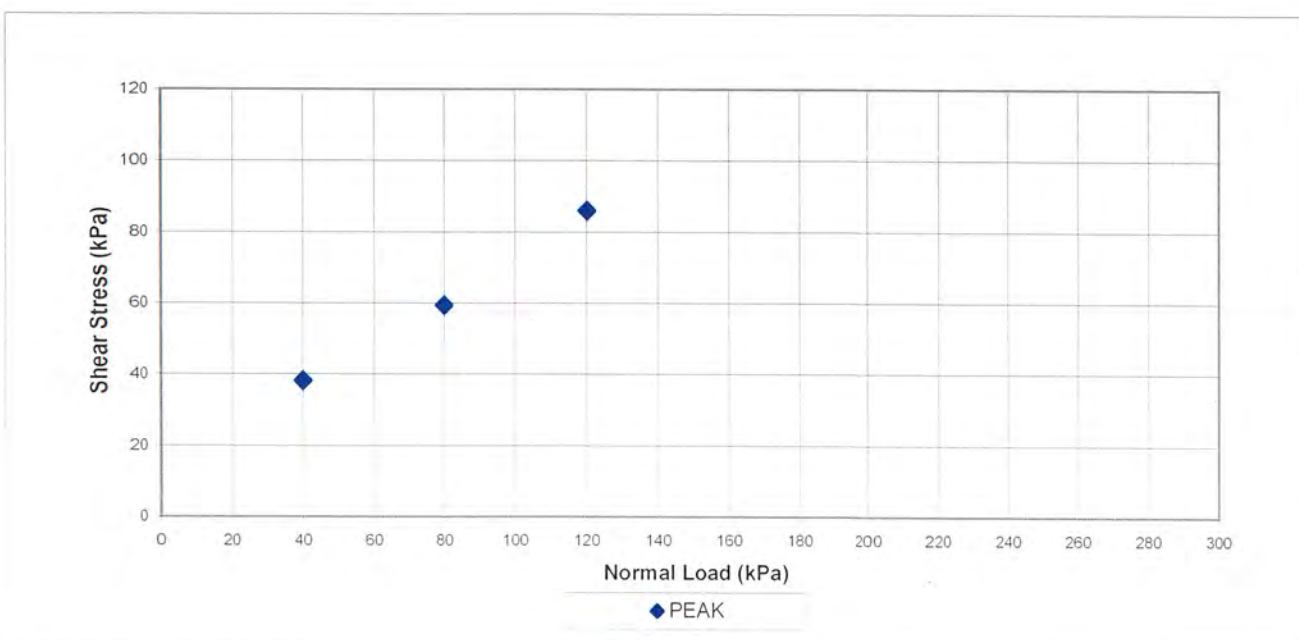
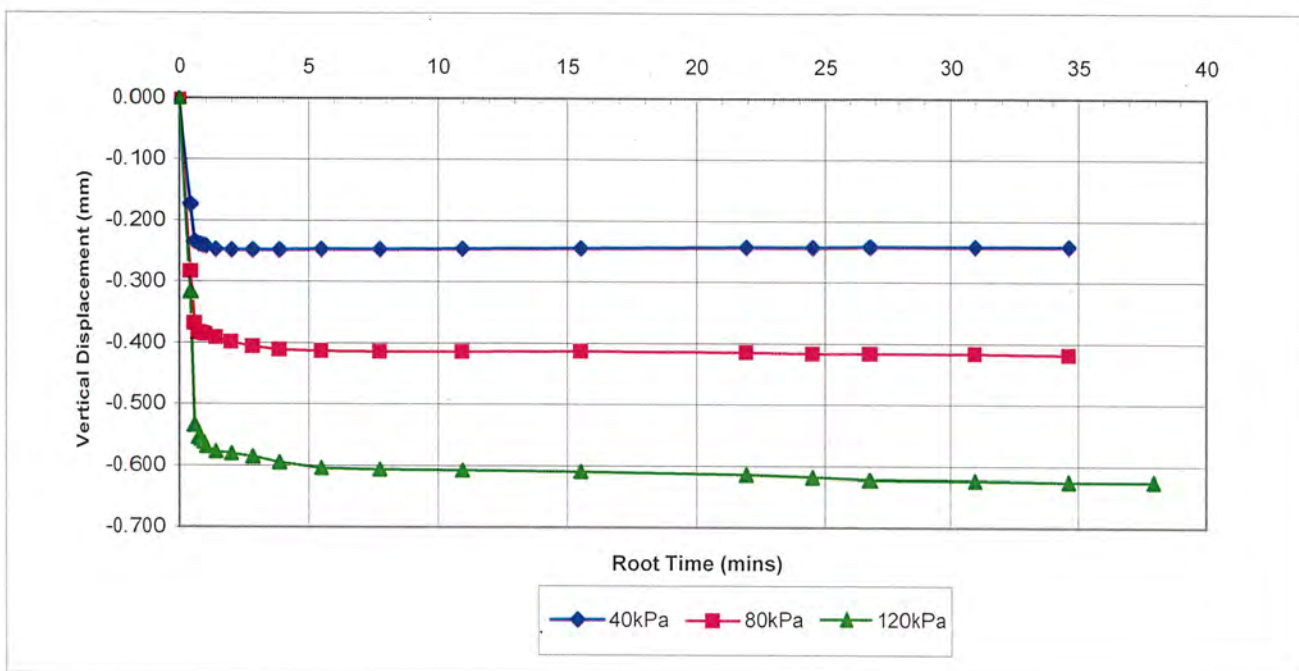
**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** TP SBC012A

**Sample:** B13

**Depth:** 4.00 m.





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

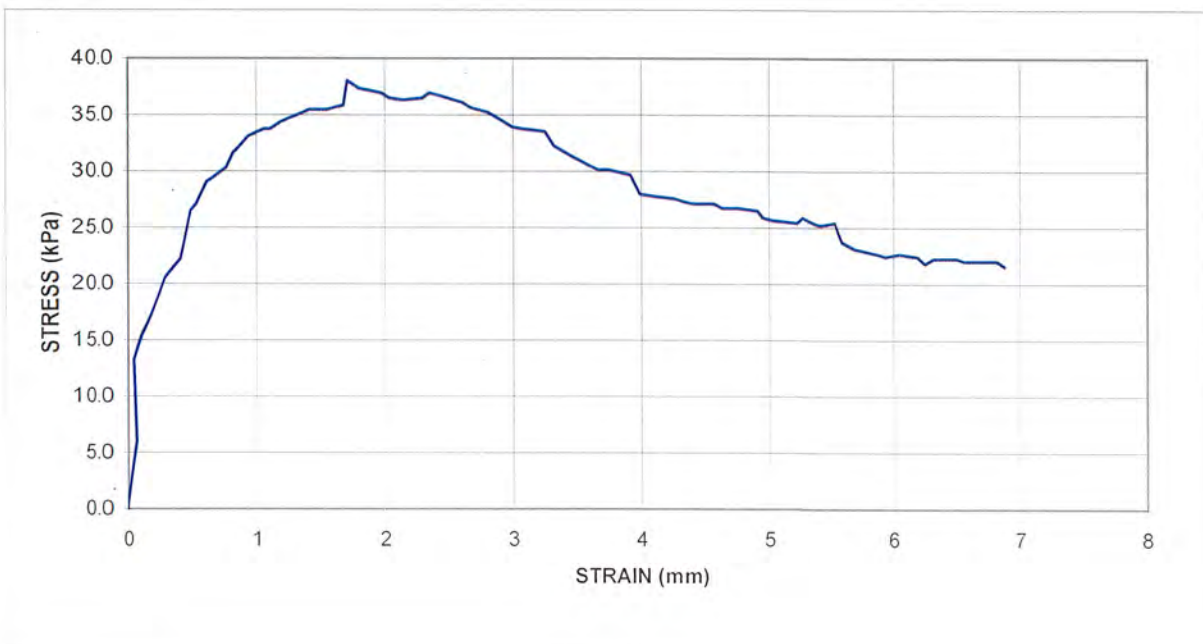
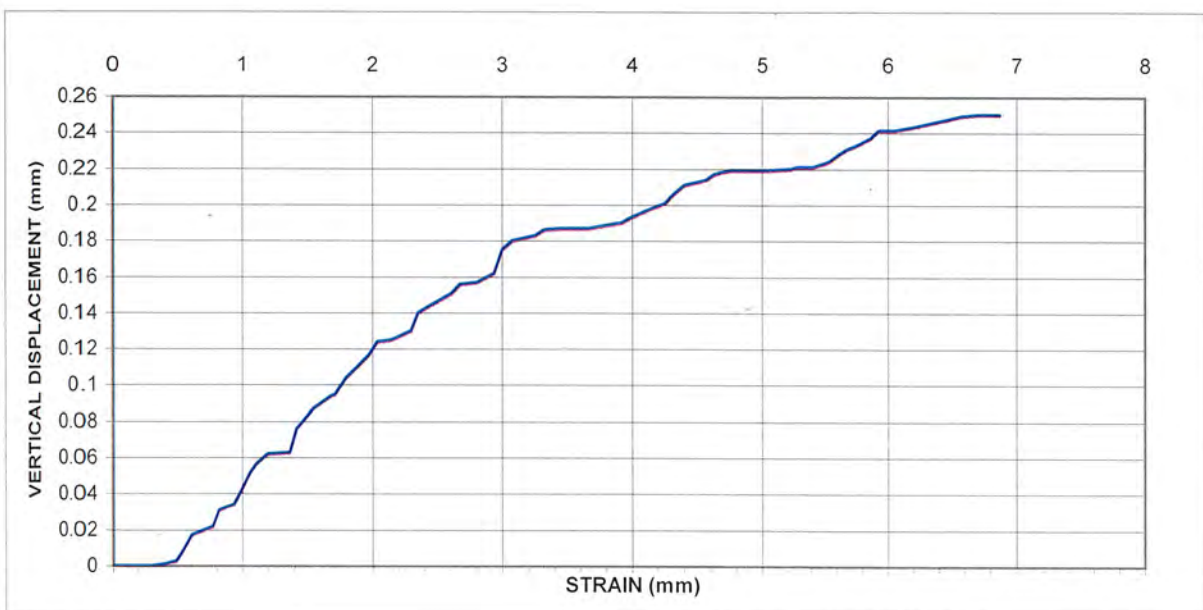
**Borehole:** TP SBC012A

**Sample:** B13

**Depth:** 4.00 m.

**Stage Number** 1

**Pressure** 40 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

1367

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

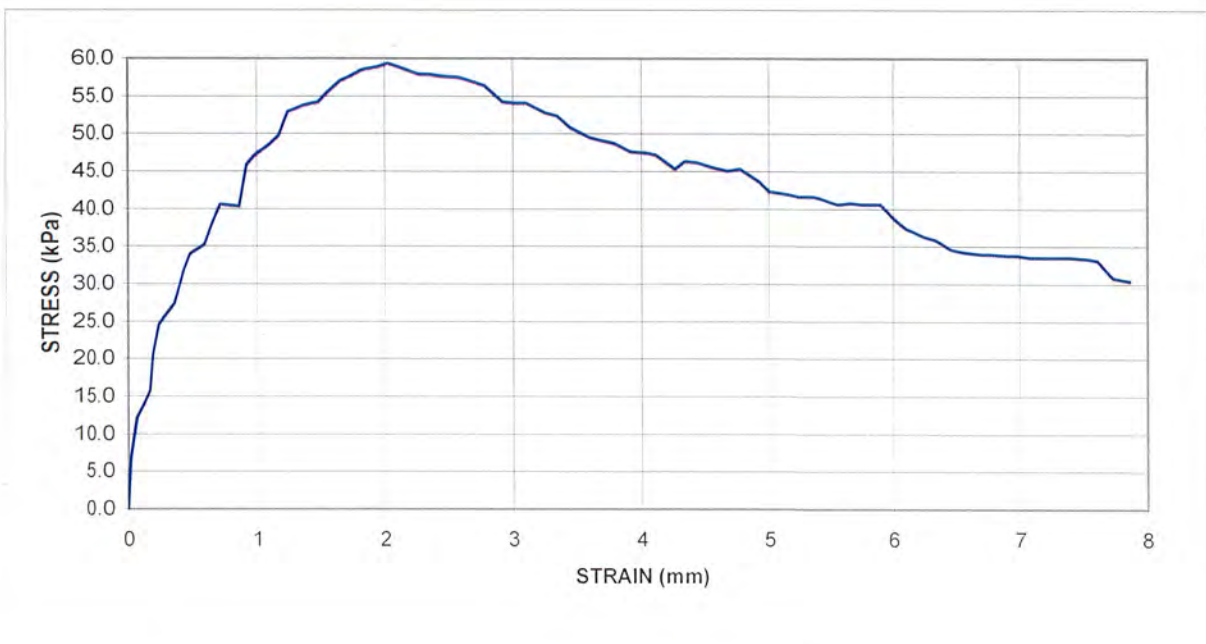
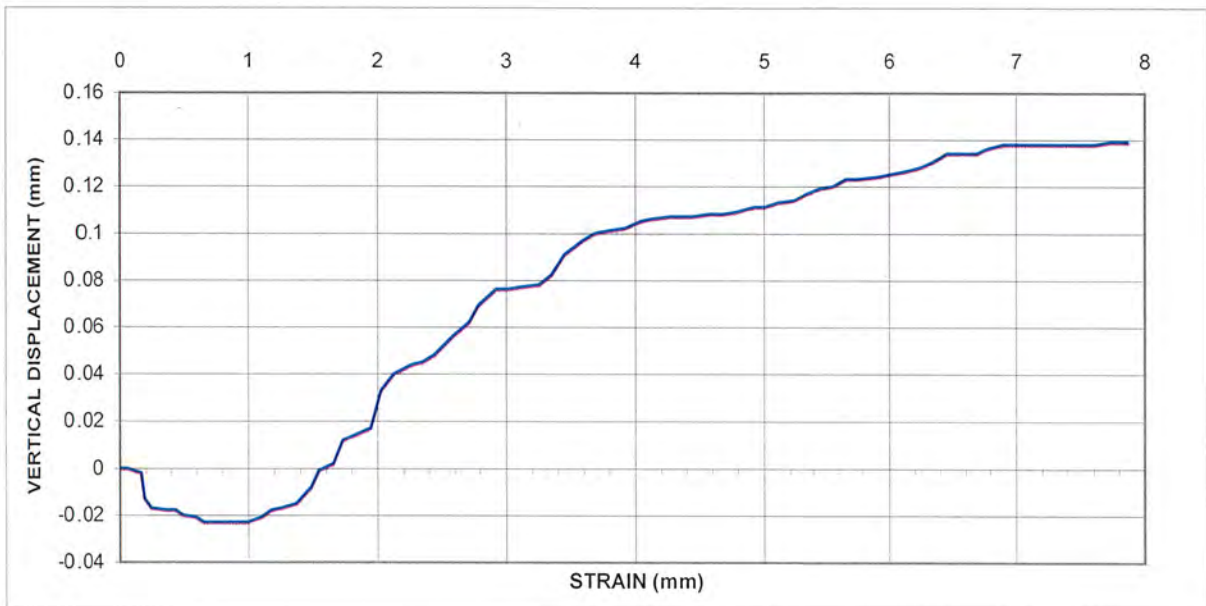
**Borehole:** TP SBC012A

**Sample:** B13

**Depth:** 4.00 m.

**Stage Number** 2

**Pressure** 80 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
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 a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4  
 (Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

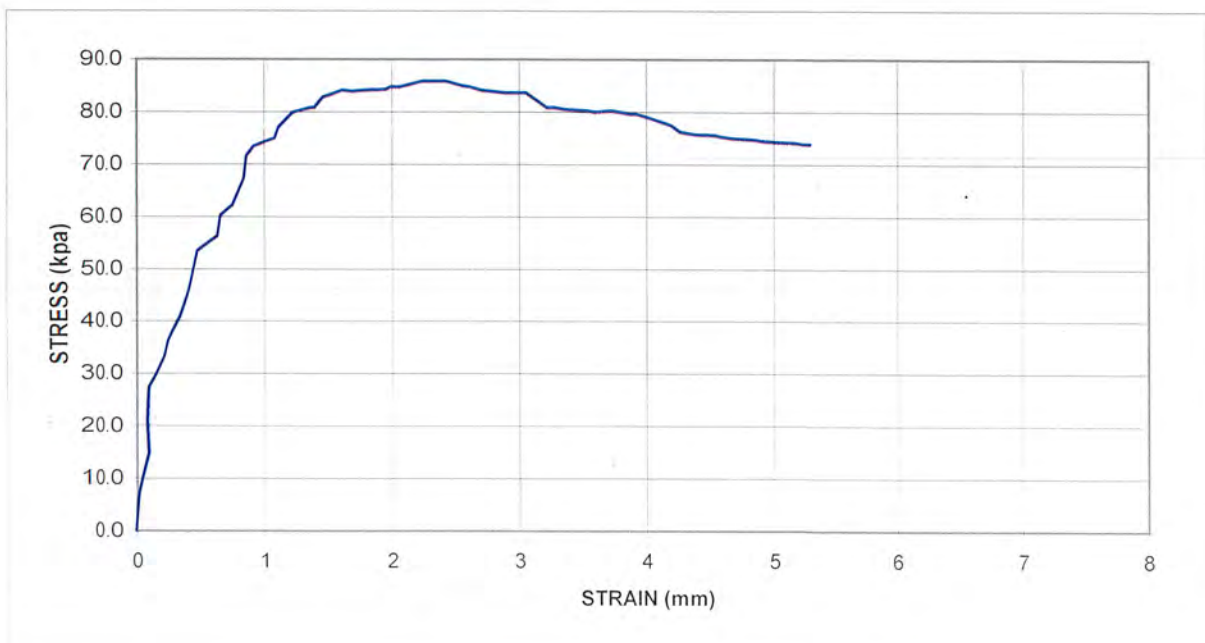
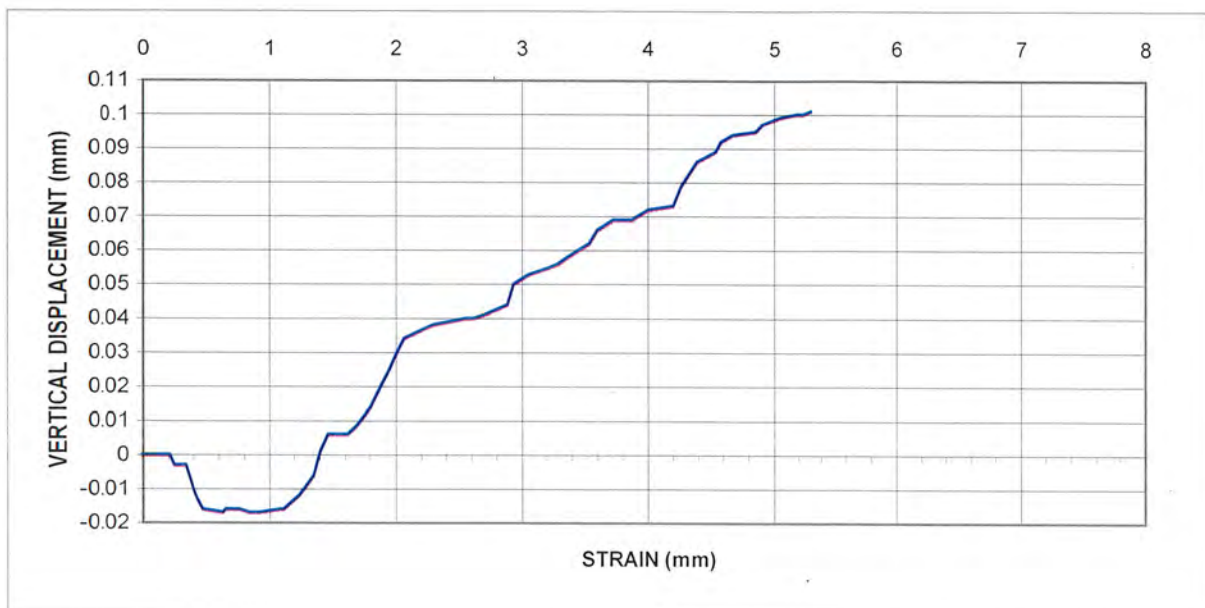
**Borehole:** TP SBC012A

**Sample:** B13

**Depth:** 4.00 m.

**Stage Number** 3

**Pressure** 120 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** TP SBC028

**Sample:** B19

**Depth:** 4.80 m

For sample description please refer to sample description sheet

Stage Number		1	2	3
Specific Depth	m.	N/A	N/A	N/A
Length	mm	60.0	60.0	60.0
Height	mm	23.1	23.1	23.2
Initial Moisture Content	%	10.7	10.7	10.7
Initial Wet density	mg/m <sup>3</sup>	2.13	2.15	2.17
Initial Dry density	mg/m <sup>3</sup>	1.94	1.94	1.96
Particle Density (Assumed)	mg/m <sup>3</sup>	2.65	2.65	2.65

### CONSOLIDATION

Normal Stress	kPa	50	100	200
Height at end of Stage	mm	22.7	22.6	22.6
Duration	Day(s)	0.5	0.5	0.5

### SHEARING

Rate of Strain	mm/min	0.037	0.038	0.037
Peak Shear Stress	kPa	40.6	80.0	134.3
Displacement at Peak Stress	mm	1.98	2.45	2.85
Rate for Residual Runs	mm/min	N/A	N/A	N/A
Residual Shear Stress	kPa	N/A	N/A	N/A
Duration	Day(s)	0.5	0.5	0.5
Final Moisture Content	%	14.7	13.7	13.0
Final Wet Density	mg/m <sup>3</sup>	2.24	2.26	2.28
Final Dry Density	mg/m <sup>3</sup>	1.96	1.99	2.02

### PEAK SHEAR STRESS PARAMETERS

Apparent Cohesion C'	kPa	15
Angle of Shearing Resistance phi'	Deg	31°

### RESIDUAL PARAMETERS

Apparent Cohesion C'	kPa	N/A
Angle of Shearing Resistance phi'r	Deg	N/A

**REMARKS:** Remoulded (2.5kg Rammer).

**DATE TESTED** 22/07/2021

**DATE OF ISSUE** 02/08/2021

**NAME**

Michelle Selkirk

**APPROVED BY**





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367

## Consolidated Drained Shear Box Test BS 1377 : PART 7 : 1990 Clause 4 (Specimen(s) Tested Submerged)



**Site:** A66 North Trans Pennine Scheme C Section 9

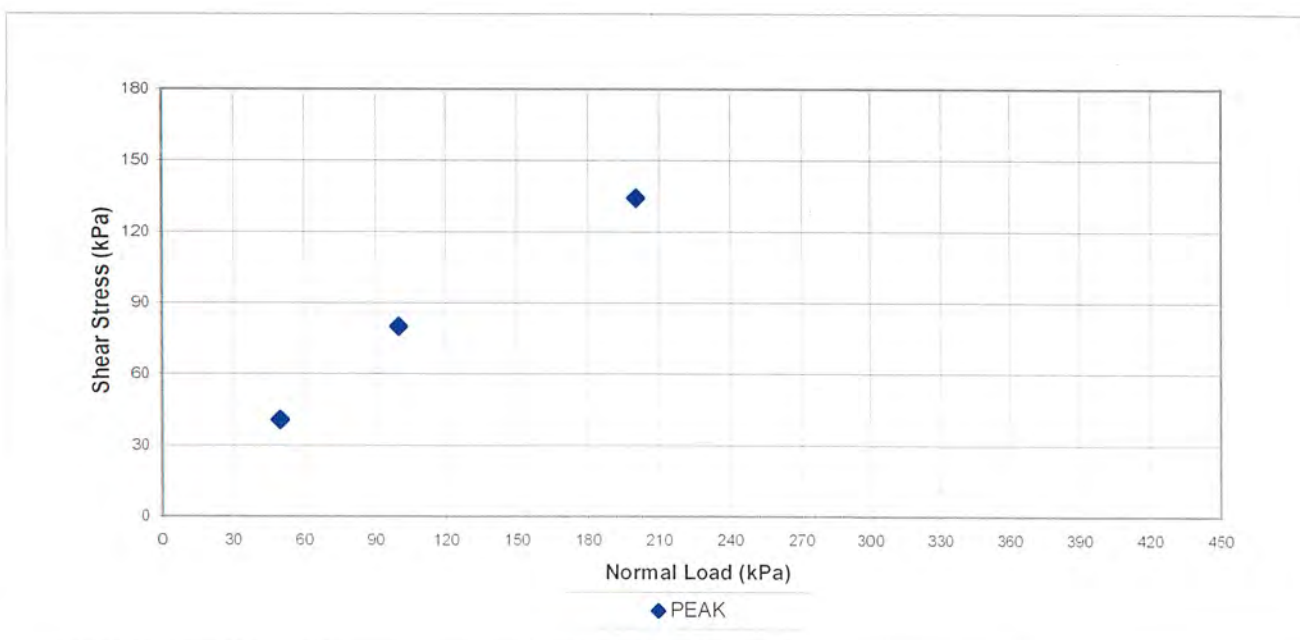
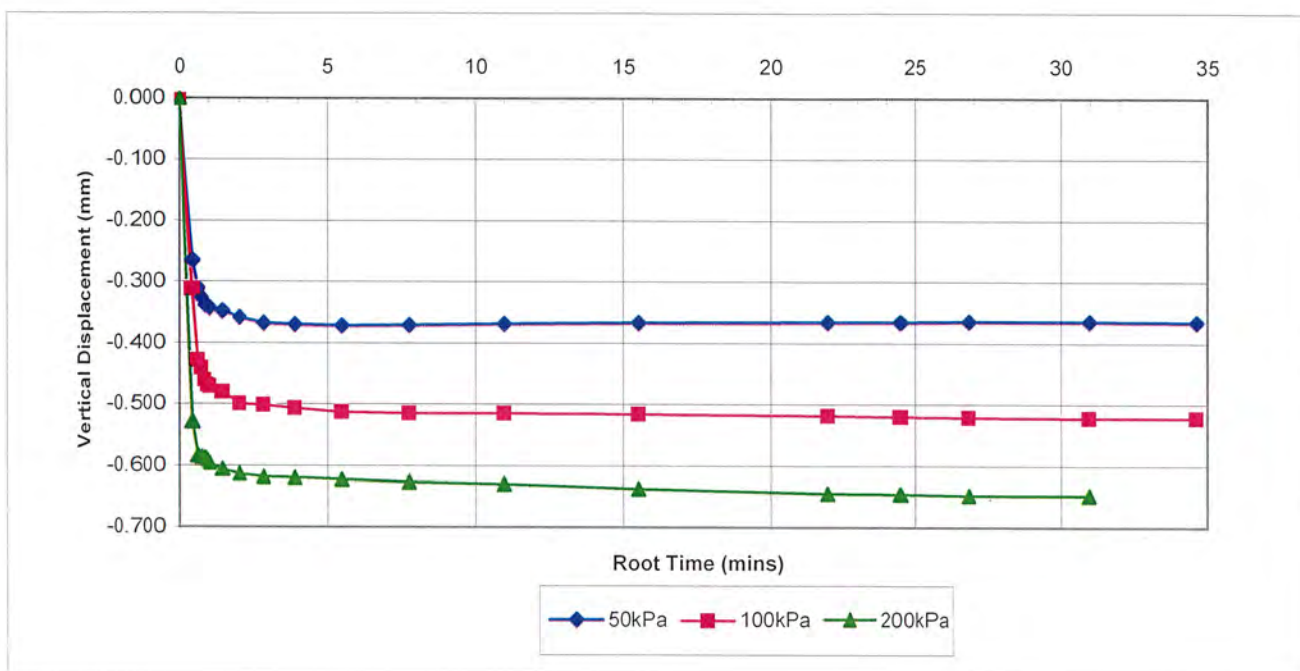
**Client:** AMEY OW Limited

**Job No:** 4322A

**Borehole:** TP SBC028

**Sample:** B19

**Depth:** 4.80 m.







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co. Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4  
 (Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

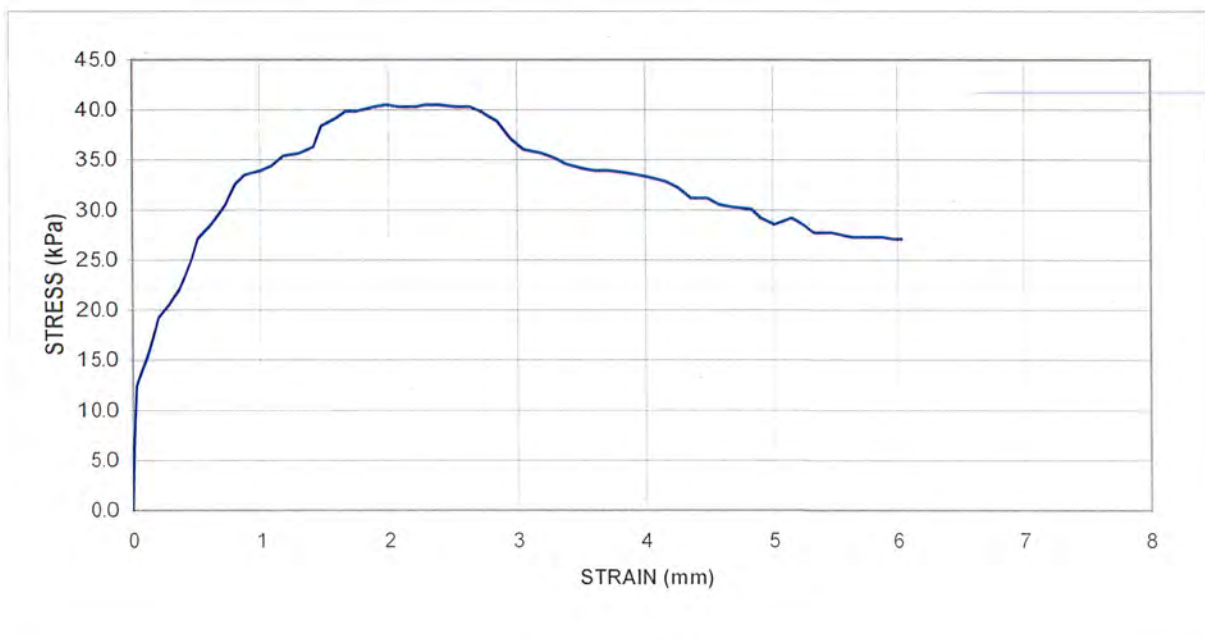
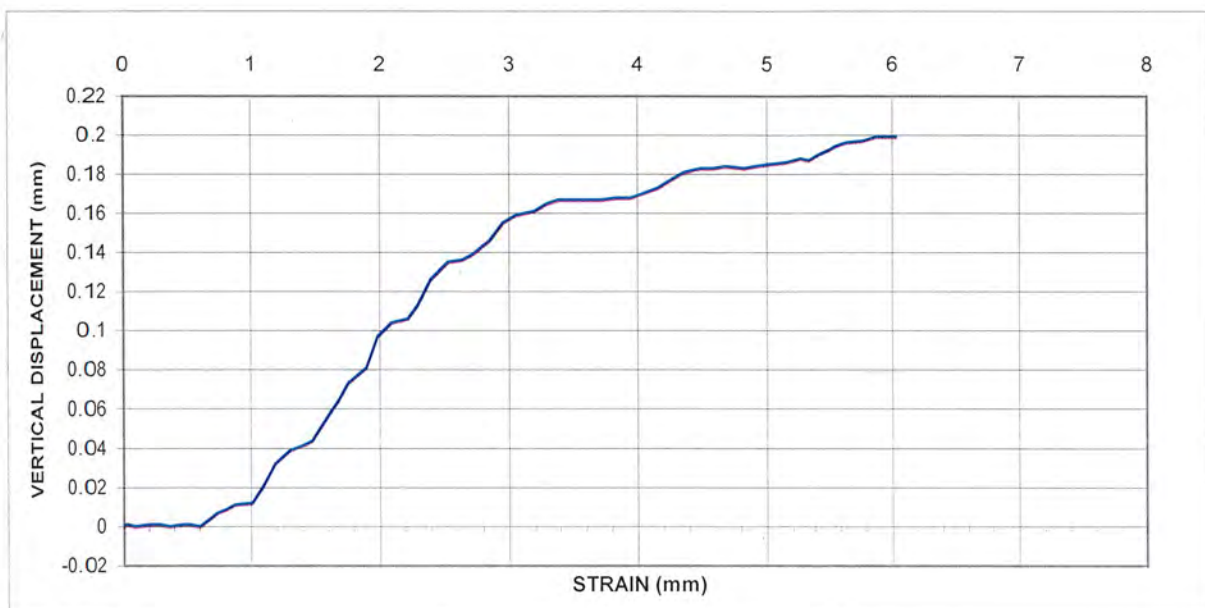
**Job No.:** 4322A

**Borehole:** TP SBC028

**Sample:** B19

**Depth:** 4.80 m.

**Stage Number** 1 **Pressure** 50 kPa





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
Chester-le-Street, Co. Durham. DH2 2RG  
a UKAS LABORATORY Testing No. 1367



## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4  
(Specimen(s) Tested Submerged)

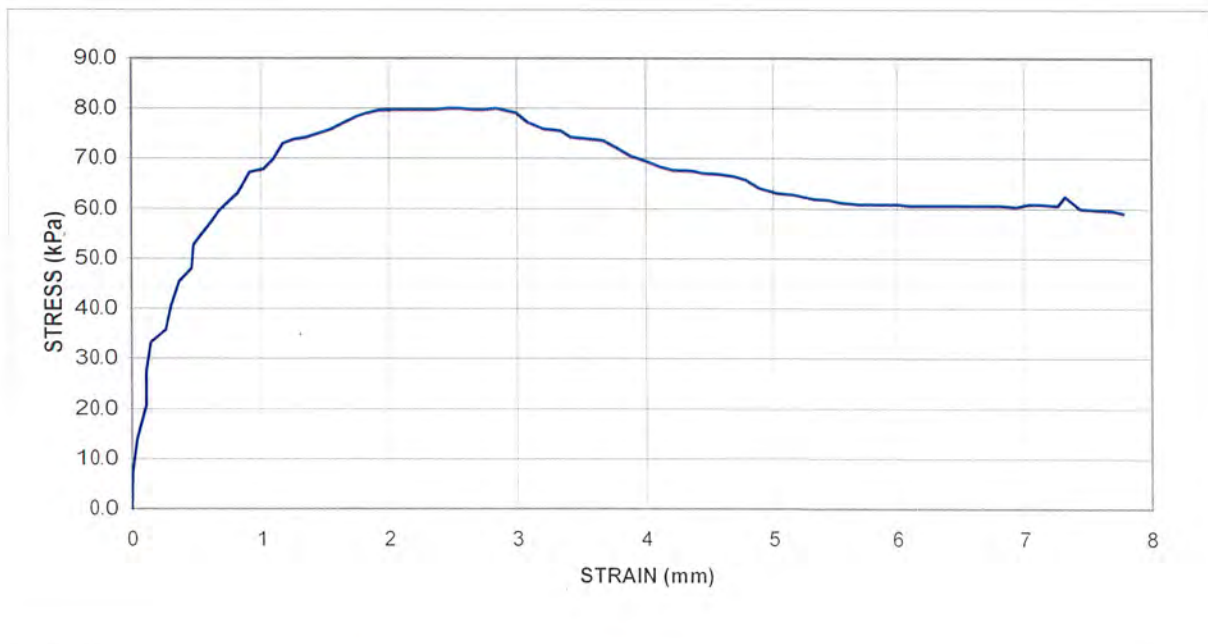
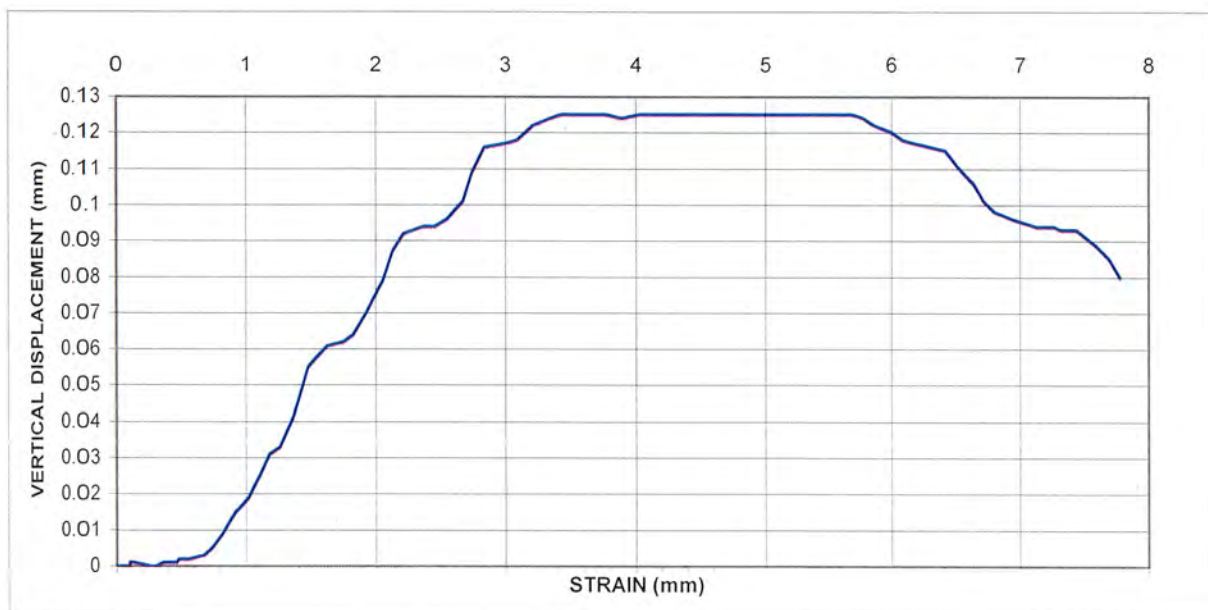
1367

**Site:** A66 North Trans Pennine Scheme C Section 9  
**Client:** AMEY OW Limited

**Job No.:** 4322A

**Borehole:** TP SBC028      **Sample:** B19      **Depth:** 4.80 m.

**Stage Number**      2      **Pressure**      100 kPa







# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate, Pelton Fell  
 Chester-le-Street, Co.Durham. DH2 2RG  
 a UKAS LABORATORY Testing No. 1367



1367

## Consolidated Drained Shear Box Test

BS 1377 : PART 7 : 1990 Clause 4

(Specimen(s) Tested Submerged)

**Site:** A66 North Trans Pennine Scheme C Section 9

**Client:** AMEY OW Limited

**Job No.:** 4322A

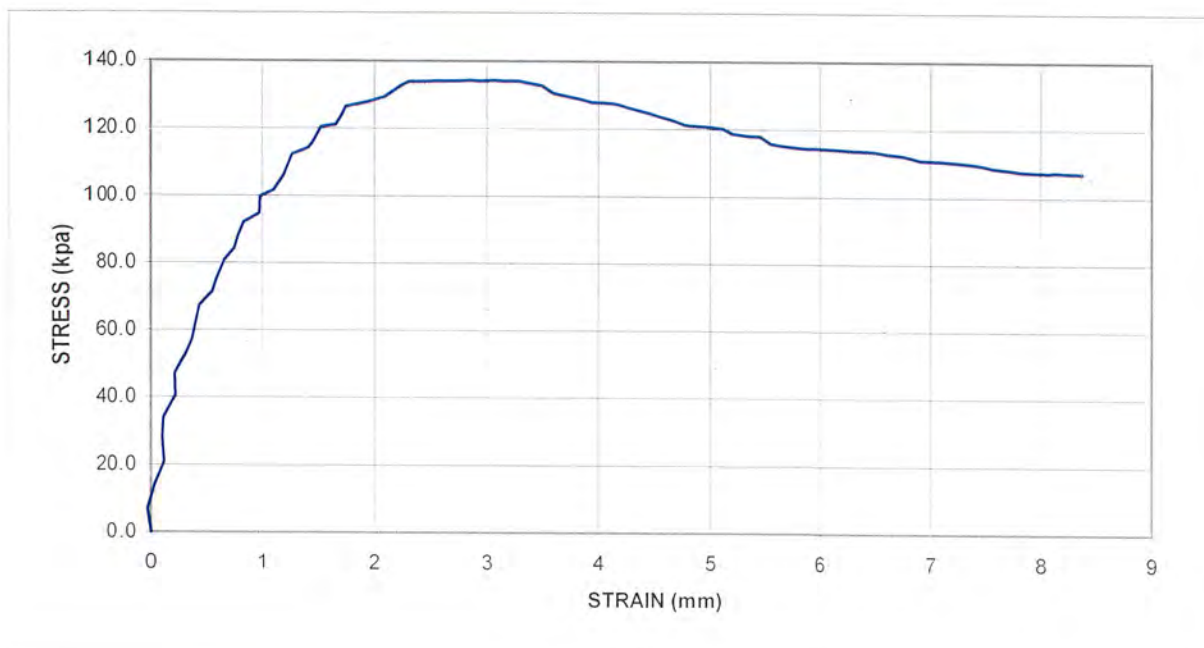
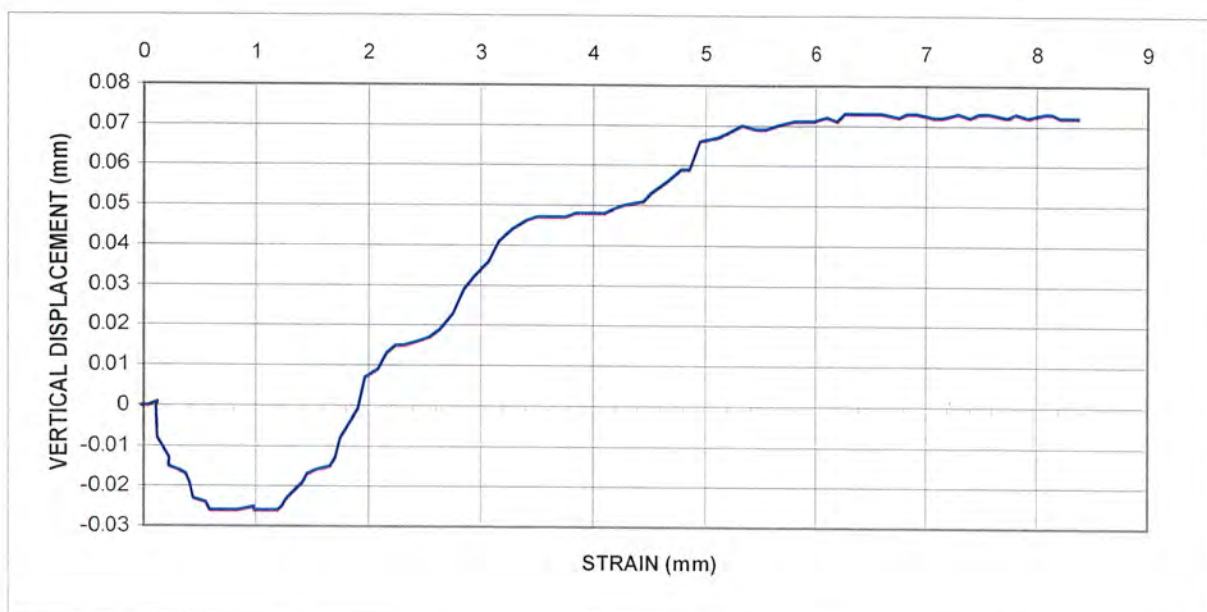
**Borehole:** TP SBC028

**Sample:** B19

**Depth:** 4.80 m.

**Stage Number** 3

**Pressure** 200 kPa



**Undrained Shear Strength in Triaxial Cell  
without Pore Water Pressure Measurement**





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1 5BL

## UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

BS 1377 : Part 7 : Clauses 8 & 9 : 1990 Part 2 Clause 3.2

Exploratory Hole	Sample ID Depth (m)	Sample ID Type	Specific Depth (m)	Diameter (mm)	Length (mm)	Prep. Method	Stage No.	Initial Moisture Content (%)	Bulk Density (Mg/m <sup>3</sup> )	Dry Density (Mg/m <sup>3</sup> )	Membrane Thickness (mm)	Membrane Correction (kPa)	Cell Pressure (kPa)	Corrected Deviator Stress (kPa)	Failure Strain (%)	Mode of Failure	cu (kPa)	Date Tested
BH SBC002	2.50	U8	2.60	103.6	202.3	UNDISTURBED	1	18	2.21	1.88	0.3	1.10	50	21	20.0	P	11	06/05/2021
BH SBC010	1.50	U8	1.60	104.8	210.2	UNDISTURBED	1	12	2.23	1.99	0.4	1.45	30	162	20.0	C	81	28/04/2021
BH SBC011	3.30	U13	3.34	103.3	209.2	UNDISTURBED	1	20	2.15	1.80	0.3	1.10	25	39	20.0	P	19	04/05/2021
BH SBC012	1.30	U10	1.33	103.8	180.1	UNDISTURBED	1	17	2.20	1.88	0.3	1.10	25	164	20.0	C	82	04/05/2021
BH SBC012	9.00	U35	9.05	103.9	210.9	UNDISTURBED	1	15	2.19	1.90	0.3	0.68	100	204	10.5	C	102	04/05/2021
BH SBC012	9.00	U35	9.05			UNDISTURBED	2					0.81	200	218	13.5		109	04/05/2021
BH SBC012	9.00	U35	9.05			UNDISTURBED	3					1.10	400	240	20.0		120	04/05/2021
BH SBC013	1.50	U5	1.54	103.7	212.2	UNDISTURBED	1	19	2.07	1.74	0.3	1.10	25	67	20.0	C	34	06/05/2021
BH SBC013	5.50	U19	5.60	102.7	210.7	UNDISTURBED	1	13	2.25	2.00	0.3	0.82	50	62	13.5	C	31	06/05/2021
BH SBC013	5.50	U19	5.60			UNDISTURBED	2					0.97	100	70	17.0		35	06/05/2021
BH SBC013	5.50	U19	5.60			UNDISTURBED	3					1.11	200	79	20.0		40	06/05/2021
BH SBC014A	3.50	U11	3.50	104.0	211.0	UNDISTURBED	1	12	2.22	1.98	0.3	1.07	50	173	19.5	C	87	04/05/2021
BH SBC014A	5.50	U17	5.58	102.2	210.1	UNDISTURBED	1	15	2.09	1.83	0.3	0.88	50	213	14.5	C	107	04/05/2021
BH SBC014A	5.50	U17	5.58			UNDISTURBED	2					0.99	100	223	17.5		111	04/05/2021
BH SBC014A	5.50	U17	5.58			UNDISTURBED	3					1.12	200	230	20.0		115	04/05/2021

For description of sample please refer to the Laboratory Sample Description Sheet. Please note the rate of strain was 2% per minute and the orientation of the test specimen was vertical. Latex membrane used.

<b>Date of issue :-</b> 24/05/2021	<b>Certificate No :-</b> TXL/4322A/1	<b>Sig</b> 	<b>Name</b> <b>M. SELKIRK</b>
<b>Client :-</b> AMEY OW Limited	<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9		<b>Page 1 of 3</b> AEG Contract No :- 4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH1 1SE  
Regional Office: Unit 20, Business Development Centre, Estam Wharf, Blackburn, BB1 5E

## UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

BS 1377 : Part 7 : Clauses 8 & 9 : 1990 Part 2 Clause 3.2

Exploratory Hole	Sample ID Depth (m)	Sample ID Type	Specific Depth (m)	Diameter (mm)	Length (mm)	Prep. Method	Stage No.	Initial Moisture Content (%)	Bulk Density (Mg/m <sup>3</sup> )	Dry Density (Mg/m <sup>3</sup> )	Membrane Thickness (mm)	Membrane Correction (kPa)	Cell Pressure (kPa)	Corrected Deviator Stress (kPa)	Failure Strain (%)	Mode of Failure	cu (kPa)	Date Tested
BH SBC014A	15.30	C29	15.30	87.2	210.3	UNDISTURBED	1	17	2.14	1.83	0.3	0.78	150	318	10.0	C	159	15/04/2021
BH SBC014A	15.30	C29	15.30	87.2	210.3	UNDISTURBED	2	17	2.14	1.83	0.3	0.92	300	333	12.5	C	167	15/04/2021
BH SBC014A	15.30	C29	15.30	87.2	210.3	UNDISTURBED	3	17	2.15	1.84	0.3	0.97	600	315	13.5	C	158	15/04/2021
BH SBC015	7.00	U20	7.08	103.5	210.9	UNDISTURBED	1	16	2.16	1.87	0.3	1.10	75	108	20.0	P	54	04/05/2021
BH SBC015	10.00	U28	10.20	103.6	210.6	UNDISTURBED	1	15	2.14	1.86	0.3	1.10	100	172	20.0	C	86	04/05/2021
BH SBC016	5.50	U15	5.58	102.3	211.8	UNDISTURBED	1	19	2.06	1.73	0.3	0.95	100	48	16.5	P	24	04/05/2021
BH SBC017	4.50	U14	4.55	102.9	211.1	UNDISTURBED	1	14	2.20	1.93	0.4	1.11	75	174	20.0	C	87	04/05/2021
BH SBC021	6.30	U23	6.34	103.5	211.5	UNDISTURBED	1	14	2.14	1.87	0.3	1.10	50	81	20.0	P	41	06/05/2021
BH SBC022	4.50	U15	4.58	103.2	210.7	UNDISTURBED	1	15	2.22	1.94	0.3	1.11	50	133	20.0	P	67	06/05/2021
BH SBC023A	1.20	U9	1.24	102.1	212.1	UNDISTURBED	1	19	2.18	1.84	0.3	0.71	25	173	11.0	C	86	04/05/2021
BH SBC023A	1.20	U9	1.24			UNDISTURBED	2					0.90	50	187	15.0		93	04/05/2021
BH SBC023A	1.20	U9	1.24			UNDISTURBED	3					0.91	100	191	15.5		96	04/05/2021
BH SBC023A	12.40	U31	12.45	103.6	210.3	UNDISTURBED	1	17	2.15	1.85	0.3	0.94	100	430	16.5	C	215	04/05/2021
BH SBC024	3.50	U12	3.59	100.9	210.6	UNDISTURBED	1	15	2.21	1.93	0.3	1.13	25	51	20.0	P	25	06/05/2021
BH SBC024	22.00	C38	22.60	84.6	179.9	UNDISTURBED	1	16	2.15	1.85	0.3	0.67	150	415	8.0	C	208	15/04/2021

For description of sample please refer to the Laboratory Sample Description Sheet. Please note the rate of strain was 2% per minute and the orientation of the test specimen was vertical. Latex membrane used.

	Date of issue :- 24/05/2021	Certificate No :- TXL/4322A/2	Signed :- [Redacted]	Name :- [Redacted]	Page 2 of 3	
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9			AEG Contract No :- 4322A	



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Siella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham,  
Regional Office: Unit 20, Business Development Centre, Easingham Wharf, Blackburn, BB1

## UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

BS 1377 : Part 7 : Clauses 8 & 9 : 1990 Part 2 Clause 3.2

Exploratory Hole	Sample ID	Sample Depth (m)	Sample Type	Specific Depth (m)	Diameter (mm)	Length (mm)	Prep. Method	Stage No.	Initial Moisture Content (%)	Bulk Density (Mg/m <sup>3</sup> )	Dry Density (Mg/m <sup>3</sup> )	Membrane Thickness (mm)	Membrane Correction (kPa)	Cell Pressure (kPa)	Corrected Deviator Stress (kPa)	Failure Strain (%)	Mode of Failure	cu (kPa)	Date Tested
BH SBC024	C38	22.00	C38	22.60	84.6	179.9	UNDISTURBED	2	16	2.15	1.85	0.3	0.86	300	456	11.0	C	228	15/04/2021
BH SBC024	C38	22.00	C38	22.60	84.6	179.9	UNDISTURBED	3	16	2.15	1.85	0.3	1.35	600	517	20.0	C	259	15/04/2021
BH SBC025	C38	17.00	C38	17.60	84.2	178.8	UNDISTURBED	1	15	2.15	1.87	0.3	0.56	150	702	6.5	C	351	15/04/2021
BH SBC025	C38	17.00	C38	17.60	84.2	178.8	UNDISTURBED	2	15	2.15	1.87	0.3	0.76	300	697	9.5	C	349	15/04/2021
BH SBC025	C38	17.00	C38	17.60	84.2	178.8	UNDISTURBED	3	15	2.15	1.87	0.3	1.10	600	722	15.5	C	361	15/04/2021
BH SBC026	U7	1.20	U7	1.25	104.2	211.1	UNDISTURBED	1	20	2.07	1.73	0.4	1.43	25	166	19.5	C	83	06/05/2021
BH SBC028	U14	3.50	U14	3.58	102.9	210.4	UNDISTURBED	1	12	2.26	2.01	0.3	0.87	50	203	14.5	C	102	04/05/2021
BH SBC028	U23	8.00	U23	8.05	102.9	210.9	UNDISTURBED	1	14	2.21	1.93	0.3	1.11	100	160	20.0	C	80	04/05/2021
BH SBC031	U9	2.00	U9	2.15	101.6	211.6	UNDISTURBED	1	15	2.13	1.85	0.3	0.95	25	143	16.5	C	72	19/05/2021
BH SBC031	U19	6.50	U19	6.57	101.4	210.5	UNDISTURBED	1	12	2.22	1.98	0.3	1.12	50	226	20.0	C	113	06/05/2021
BH SBC031	U31	12.50	U31	12.60	102.0	211.6	UNDISTURBED	1	14	2.31	2.03	0.4	1.49	100	231	20.0	C	115	19/05/2021
BH SBC032	U9	2.00	U9	2.20	102.3	211.0	UNDISTURBED	1	15	2.16	1.89	0.3	1.11	25	289	20.0	C	145	06/05/2021
BH SBC032A	U9	8.00	U9	8.10	103.5	211.1	UNDISTURBED	1	11	2.31	2.08	0.3	1.10	100	236	20.0	C	118	19/05/2021



For description of sample please refer to the Laboratory Sample Description Sheet. Please note the rate of strain was 2% per minute and the orientation of the test specimen was vertical. Latex membrane used.


	Date of issue :- 24/05/2021	Certificate No :- TXL4322A/3	Signed :- 	Name :- <b>M. SELKIRK</b>	Page 3 of 3
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		



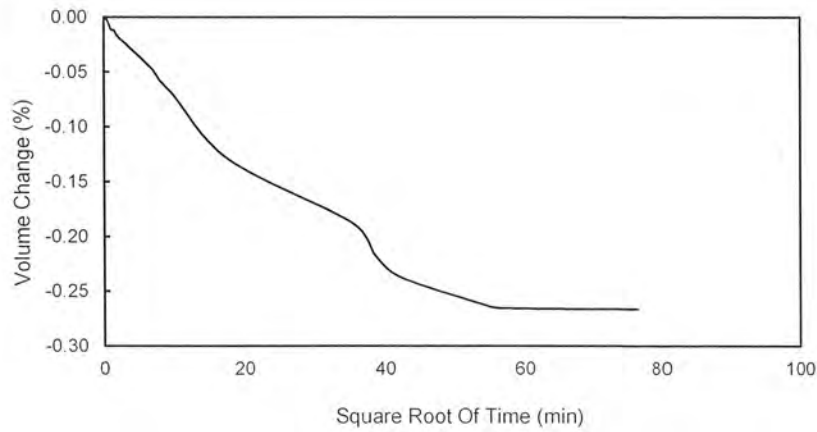
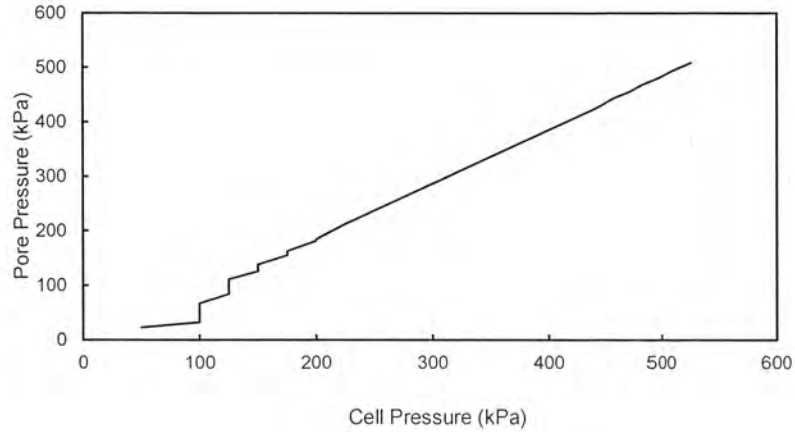
**Consolidated Undrained Shear Strength in Triaxial Cell with  
Measurement of Pore Water Pressure**




 <b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>		Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9		Contract No. <b>4322A</b>	
		Client Allied Exploration & Geotechnical Limited		Hole ID BH SBC011	
		Engineer -		Sample U20	
Description		Stiff intact grey slightly sandy gravelly CLAY. Gravel is fine to coarse.			
<b>INITIAL CONDITIONS</b>					
Depth Within Original Sample		m	6.25-6.45		
Orientation Within Original Sample		Vertical			
Specimen Preparation		Undisturbed			
Hand Vane Top		kPa	232		
Hand Vane Bottom		kPa	296		
Diameter		mm	103.6		
Height		mm	201.0		
Moisture Content		%	13		
Bulk Density		Mg/m <sup>3</sup>	2.19		
Drainage Conditions		One end and radial boundary with side drains			
<b>SATURATION</b>					
Final Cell Pressure		kPa	525		
Final Pore Pressure		kPa	509		
Final Pore Pressure Parameter B		0.99			
Duration		day	6		
<b>CONSOLIDATION</b>					
		Stage No.	1	2	3
Final Cell Pressure		kPa	525	550	600
Back Pressure		kPa	500	500	500
Effective Pressure		kPa	25	50	100
Final Pore Pressure		kPa	499	499	503
Final Pore Pressure Dissipation		%	100	100	95
Duration		day	2	2	9
<b>COMPRESSION</b>					
Cell Pressure		kPa	525	550	600
Initial Pore Pressure		kPa	499	499	503
Rate of Axial Displacement		mm/min	0.00244	0.00080	0.00050
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>					
Pore Pressure		kPa	505	517	532
Minor Effective Principal Stress		kPa	20	33	68
Deviator Stress		kPa	63	95	147
Major Effective Principal Stress		kPa	82	128	215
Effective Principal Stress Ratio			4.2	3.8	3.2
Axial Strain		%	1.5	1.8	2.3
Corrections Applied to Deviator Stress		kPa	0.3	0.3	0.4
Duration		day	2	4	7
<b>EFFECTIVE STRESS PARAMETERS</b>					
Cohesion c'		kPa	8		
Angle of Shearing Resistance $\phi'$		degree	28.4		
<b>FINAL CONDITIONS</b>					
Moisture Content		%	15		
Bulk Density		Mg/m <sup>3</sup>	2.27		
Failure Mode		See Photograph			
Originator		Checked & Approved		<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB		15/07/2021			
					
				Sheet 1 of 8	


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
	Engineer	-	Sample	U20
			Depth (m)	6.20
			Sample Type	U

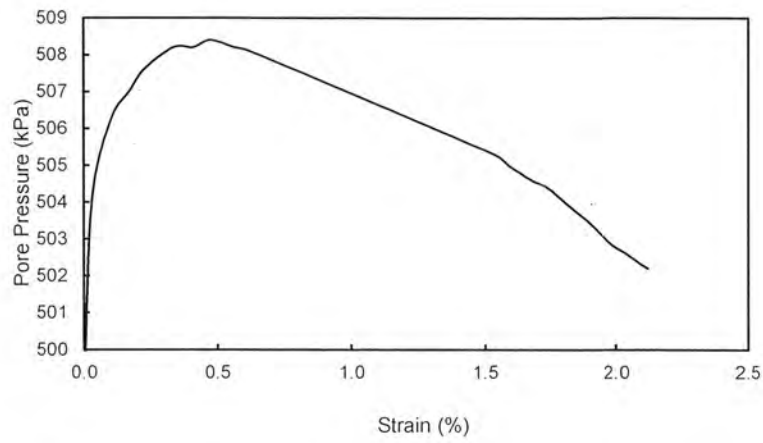
STAGE 1



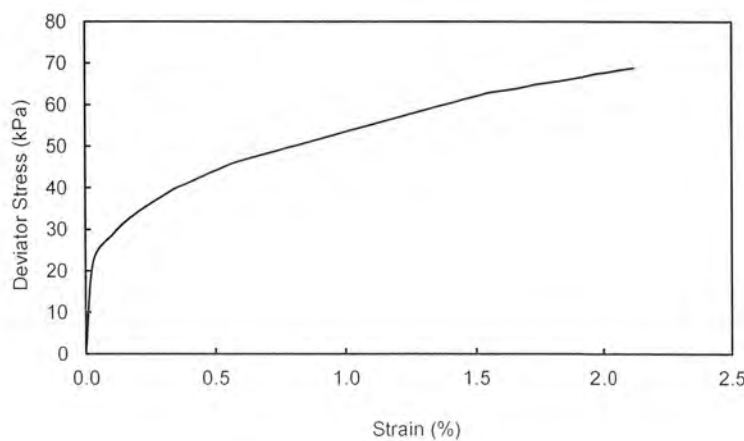
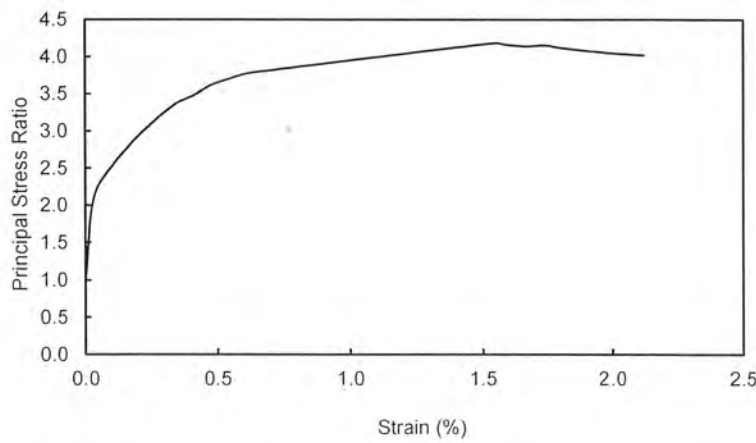
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		
			Sheet 2 of 8





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
	Engineer	-	Sample	U20
			Depth (m)	6.20
			Sample Type	U



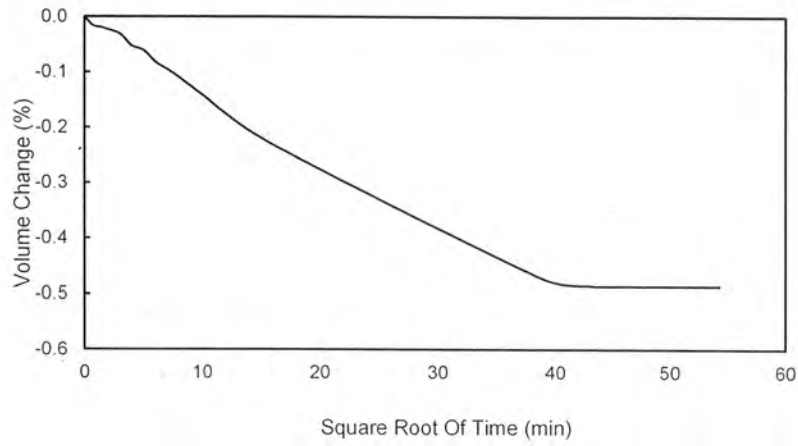
STAGE 1




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> PS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	[Redacted]		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC011 Sample U20 Depth (m) 6.20 Sample Type U
	Engineer -	

STAGE 2



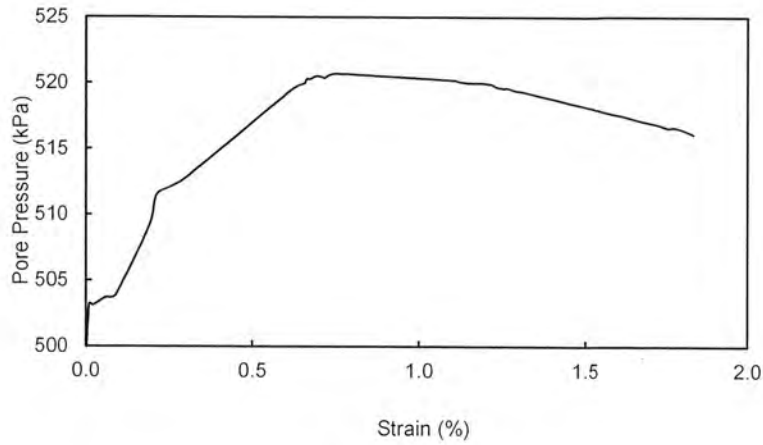
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MDB	15/07/2021		



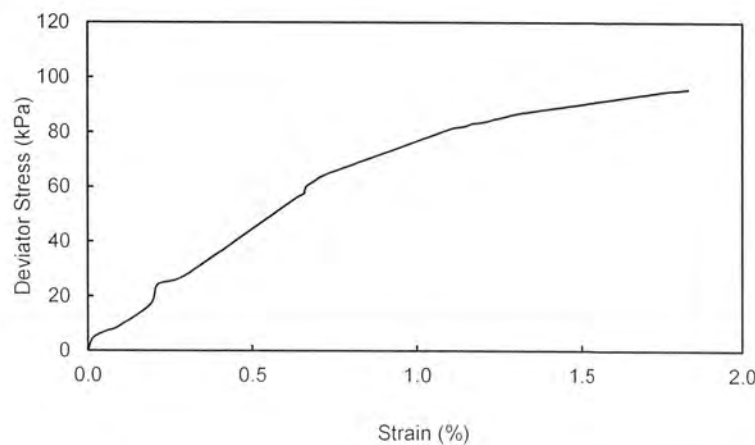
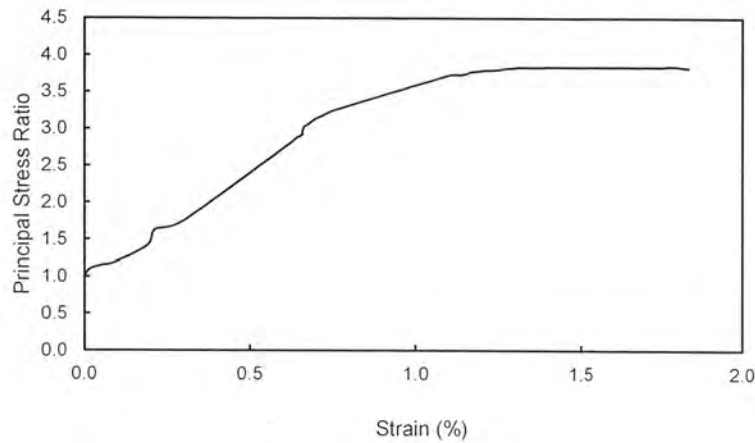


SITE INVESTIGATION AND LABORATORY SERVICES

Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
Engineer	-	Sample	U20
		Depth (m)	6.20
		Sample Type	U



STAGE 2

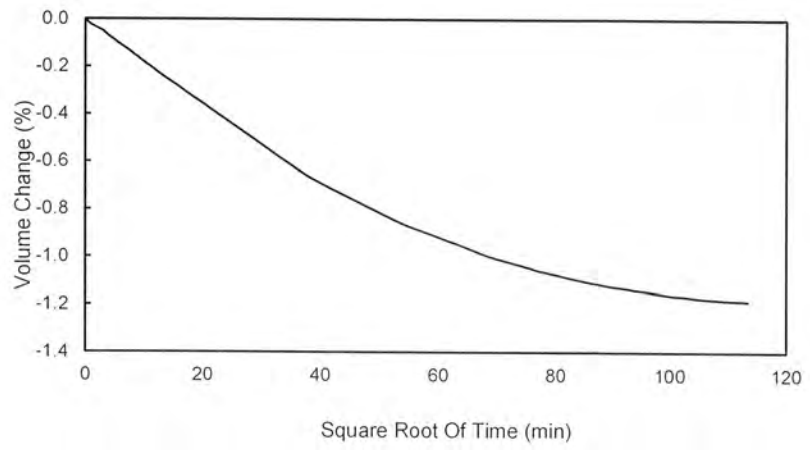


Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		



Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
Engineer	-	Sample	U20
		Depth (m)	6.20
		Sample Type	U

STAGE 3

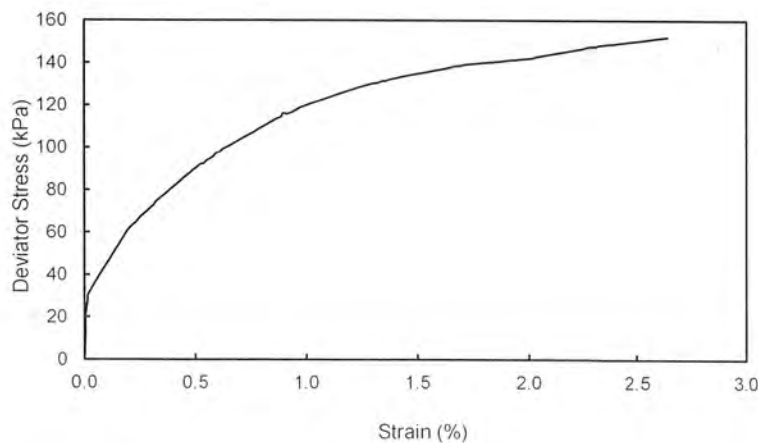
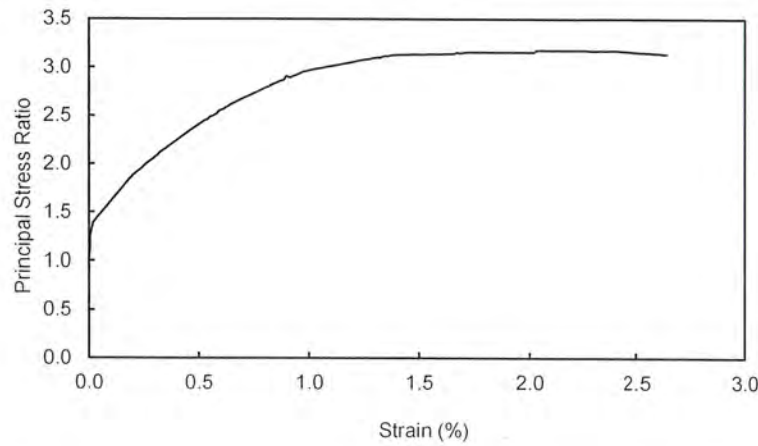
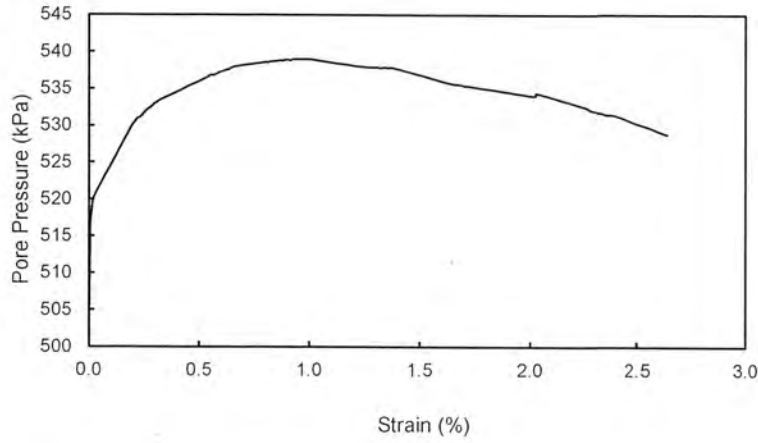



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		




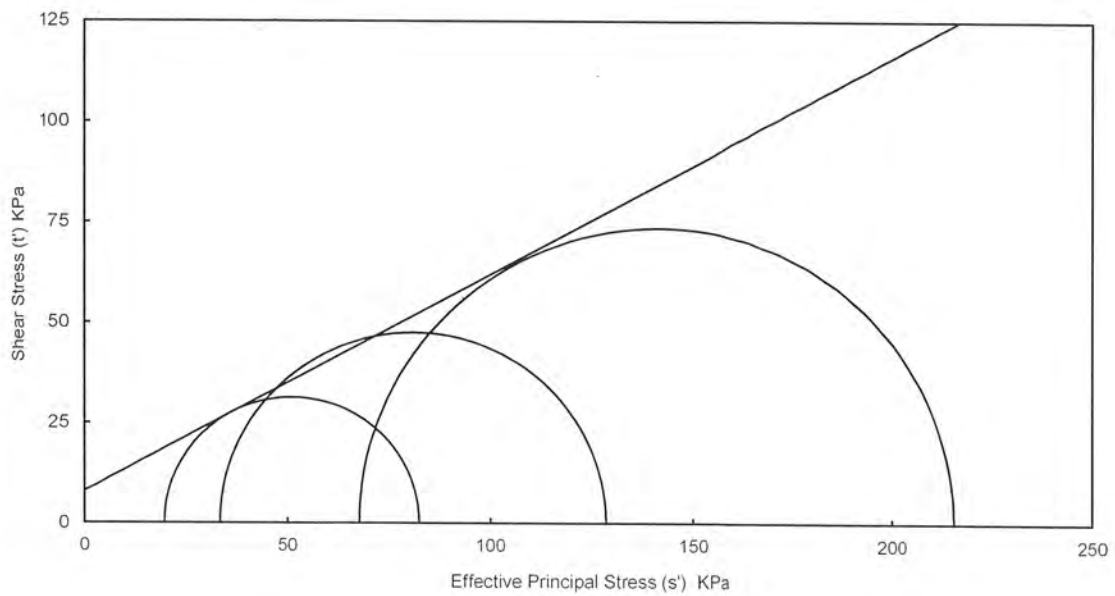
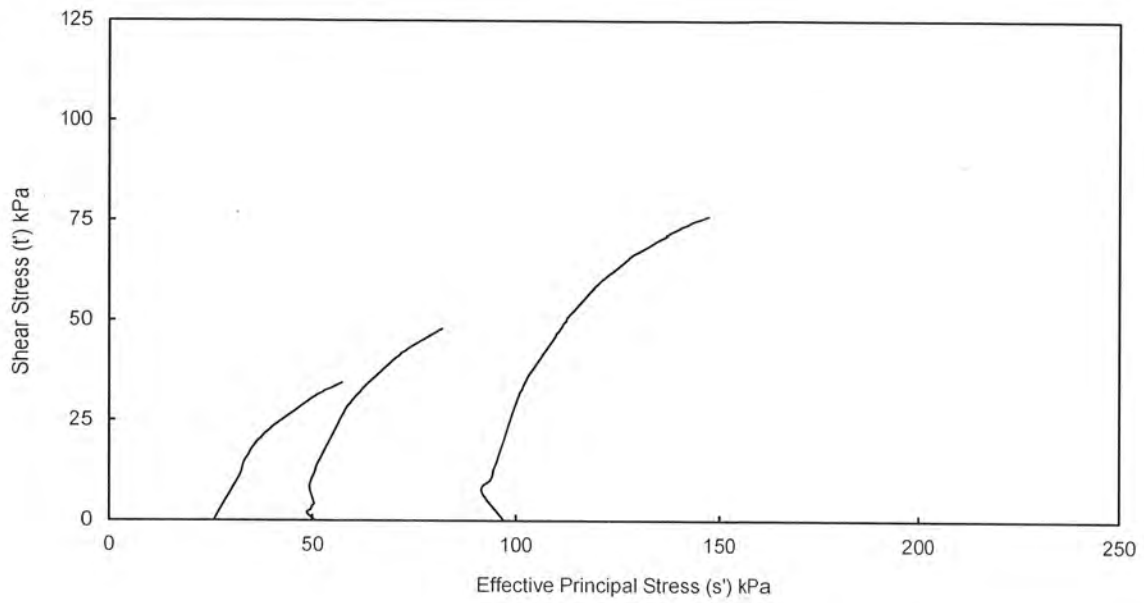
<b>TERRA TEK</b> SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
	Engineer	-	Sample	U20
			Depth (m)	6.20
			Sample Type	U



**STAGE 3**




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC011 Sample U20 Depth (m) 6.20 Sample Type U
	Engineer -	






Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	 15/07/2021		




 <p><b>TERRA TEK</b>                  SITE INVESTIGATION AND LABORATORY SERVICES</p>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC011
	Engineer	-	Sample	U20
			Depth (m)	6.20
			Sample Type	U



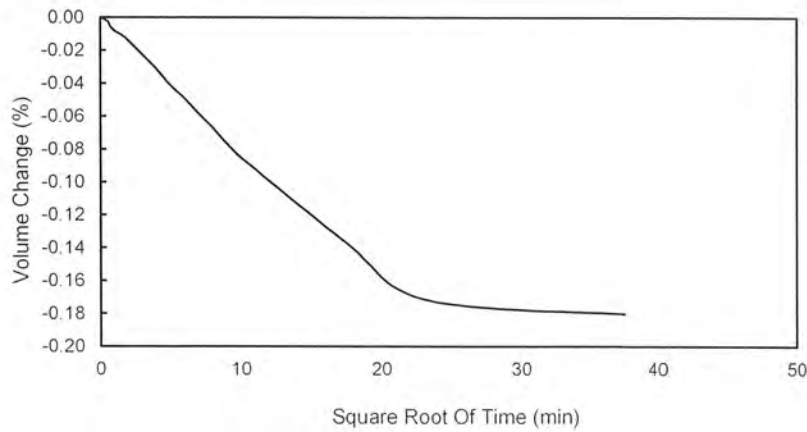
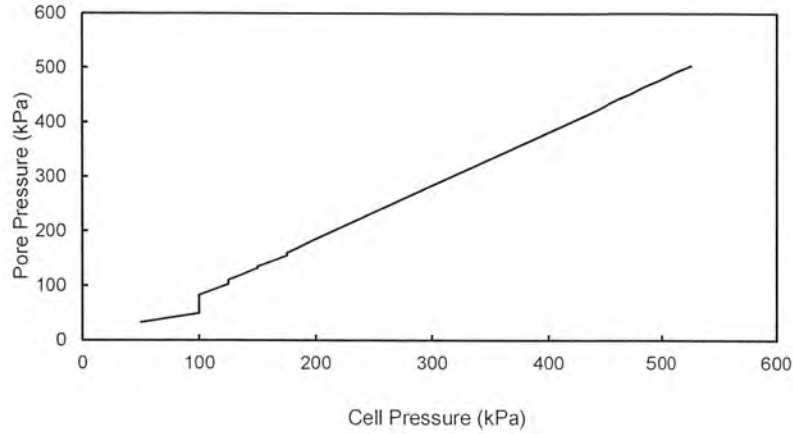
Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	15/07/2021		


 SITE INVESTIGATION AND LABORATORY SERVICES		Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9			Contract No.	4322A	
		Client	Allied Exploration & Geotechnical Limited			Hole ID	BH SBC012	
		Engineer	-			Sample	U27	
Description		Stiff intact dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse.						
<b>INITIAL CONDITIONS</b>								
Depth Within Original Sample	m	5.95-6.15						
Orientation Within Original Sample		Vertical						
Specimen Preparation		Undisturbed						
Hand Vane Top	kPa	200						
Hand Vane Bottom	kPa	151						
Diameter	mm	103.4						
Height	mm	201.7						
Moisture Content	%	14						
Bulk Density	Mg/m <sup>3</sup>	2.18						
Drainage Conditions		One end and radial boundary with side drains						
<b>SATURATION</b>								
Final Cell Pressure	kPa	525						
Final Pore Pressure	kPa	504						
Final Pore Pressure Parameter B		0.98						
Duration	day	5						
<b>CONSOLIDATION</b>		Stage No.	1	2	3			
Final Cell Pressure	kPa	525	550	600				
Back Pressure	kPa	500	500	500				
Effective Pressure	kPa	25	50	100				
Final Pore Pressure	kPa	496	495	500				
Final Pore Pressure Dissipation	%	100	100	96				
Duration	day	1	2	3				
<b>COMPRESSION</b>								
Cell Pressure	kPa	525	550	600				
Initial Pore Pressure	kPa	496	495	500				
Rate of Axial Displacement	mm/min	0.00244	0.00080	0.00183				
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>								
Pore Pressure	kPa	501	514	521				
Minor Effective Principal Stress	kPa	24	36	79				
Deviator Stress	kPa	51	79	159				
Major Effective Principal Stress	kPa	75	115	238				
Effective Principal Stress Ratio		3.1	3.2	3.0				
Axial Strain	%	1.8	1.5	3.5				
Corrections Applied to Deviator Stress	kPa	0.3	0.3	0.5				
Duration	day	2	4	3				
<b>EFFECTIVE STRESS PARAMETERS</b>								
Cohesion c'	kPa	2						
Angle of Shearing Resistance Ø'	degree	29.5						
<b>FINAL CONDITIONS</b>								
Moisture Content	%	14						
Bulk Density	Mg/m <sup>3</sup>	2.22						
Failure Mode	See Photograph							
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120						
MDB	07/07/2021							



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
	Engineer	-	Sample	U27
			Depth (m)	5.90
			Sample Type	U

STAGE 1

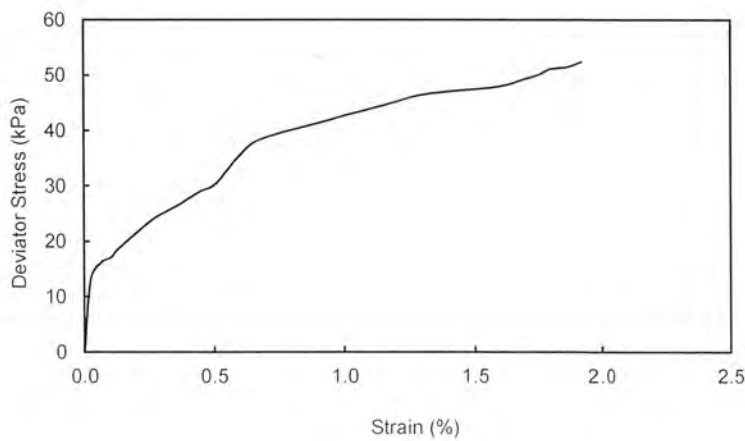
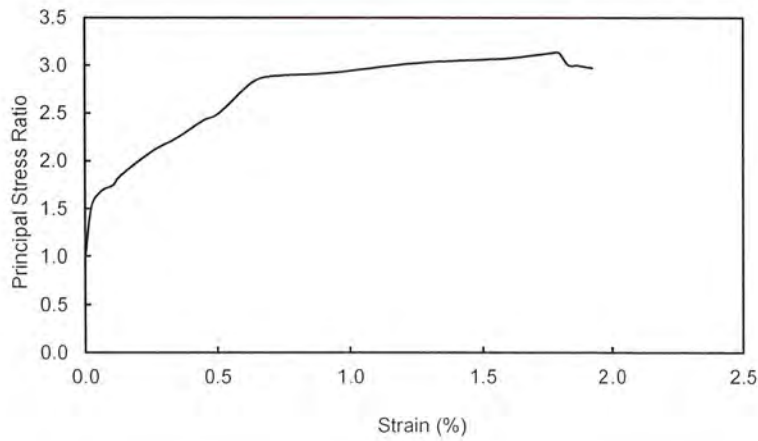
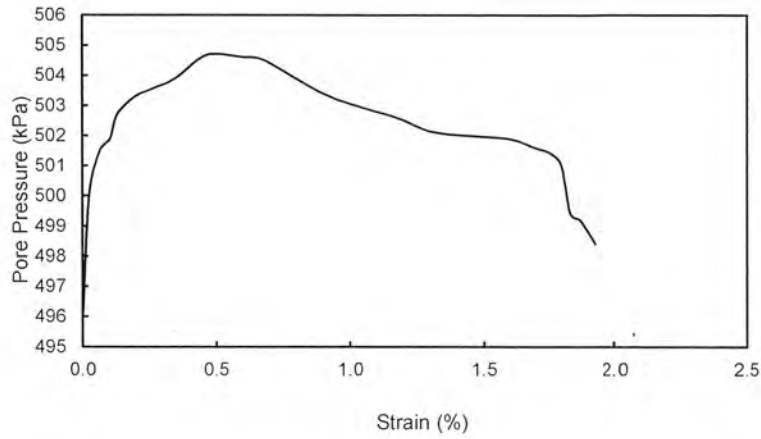


Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		




Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
Engineer	-	Sample	U27
		Depth (m)	5.90
		Sample Type	U

STAGE 1

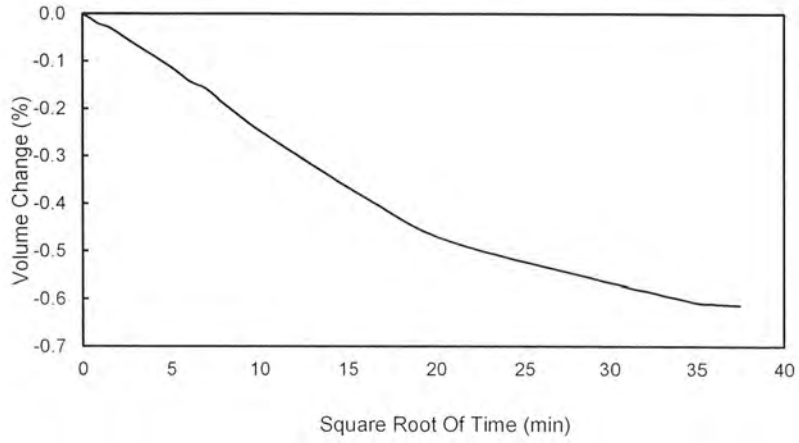




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC012 Sample U27 Depth (m) 5.90 Sample Type U
	Engineer -	

**STAGE 2**



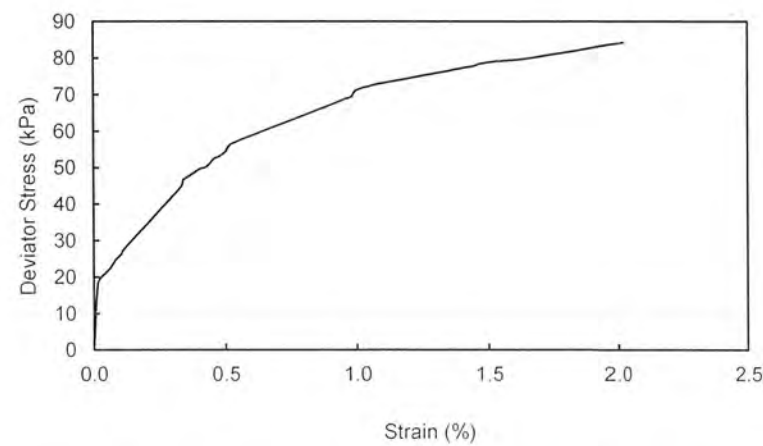
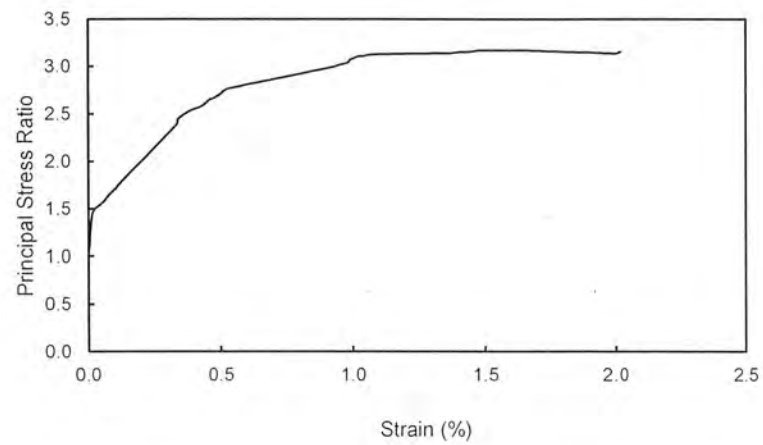
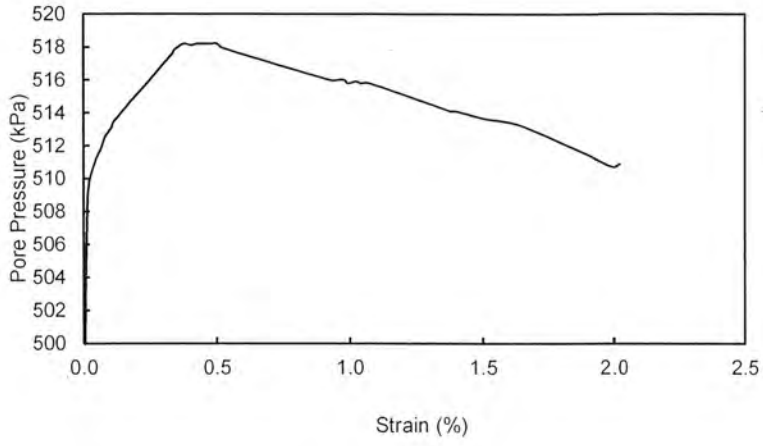
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SITE INVESTIGATION AND LABORATORY SERVICES


Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
Engineer	-	Sample	U27
		Depth (m)	5.90
		Sample Type	U

STAGE 2

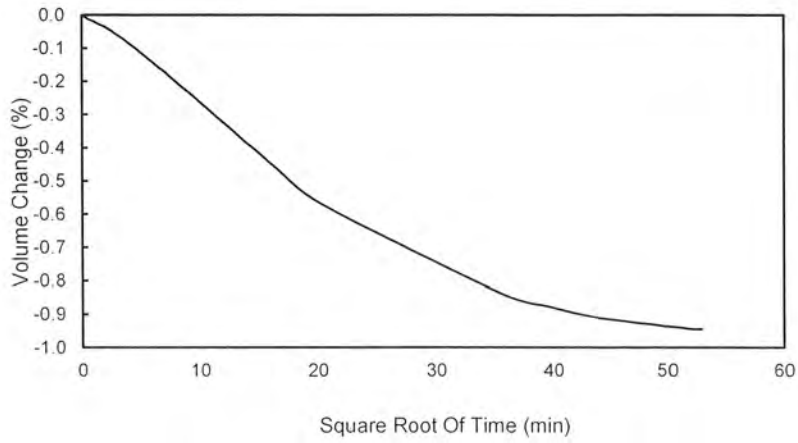




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		




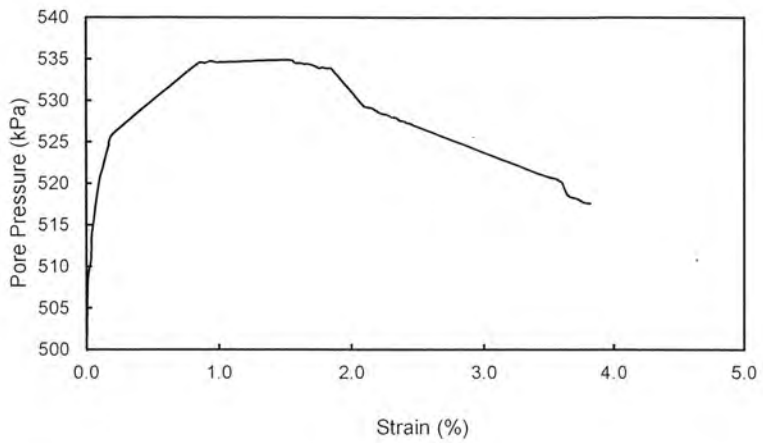
 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC012 Sample U27
	Engineer -	Depth (m) 5.90 Sample Type U

**STAGE 3**

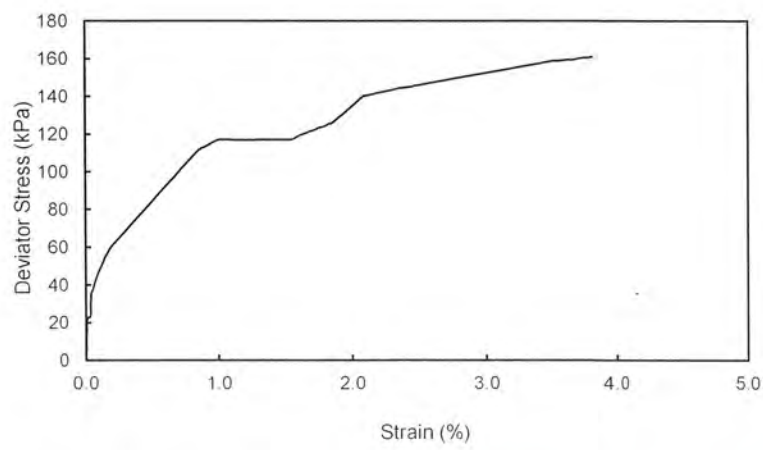
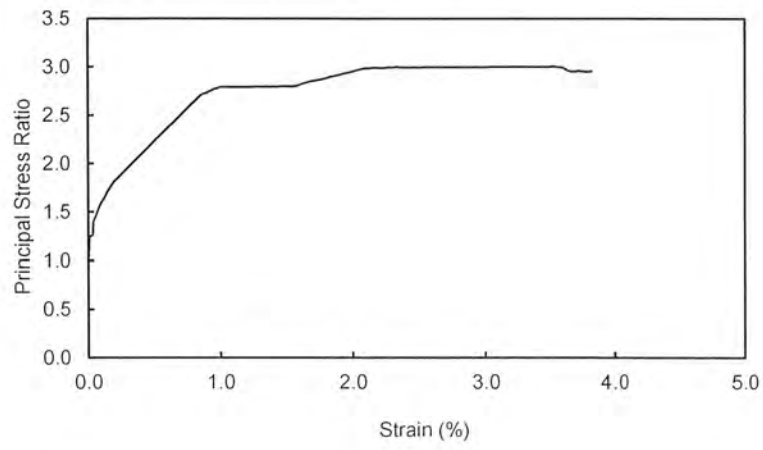



Originator MDB	Checked & Approved  07/07/2021	<p align="center"> <b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b>                      BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120                 </p>		Sheet 6 of 8
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 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
	Engineer	-	Sample	U27
			Depth (m)	5.90
			Sample Type	U




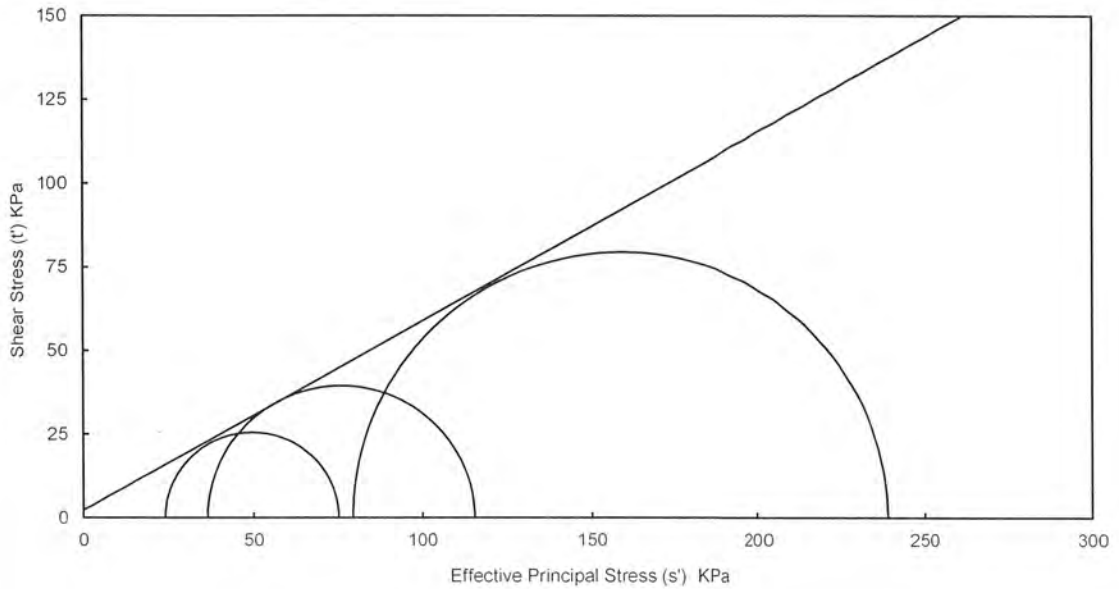
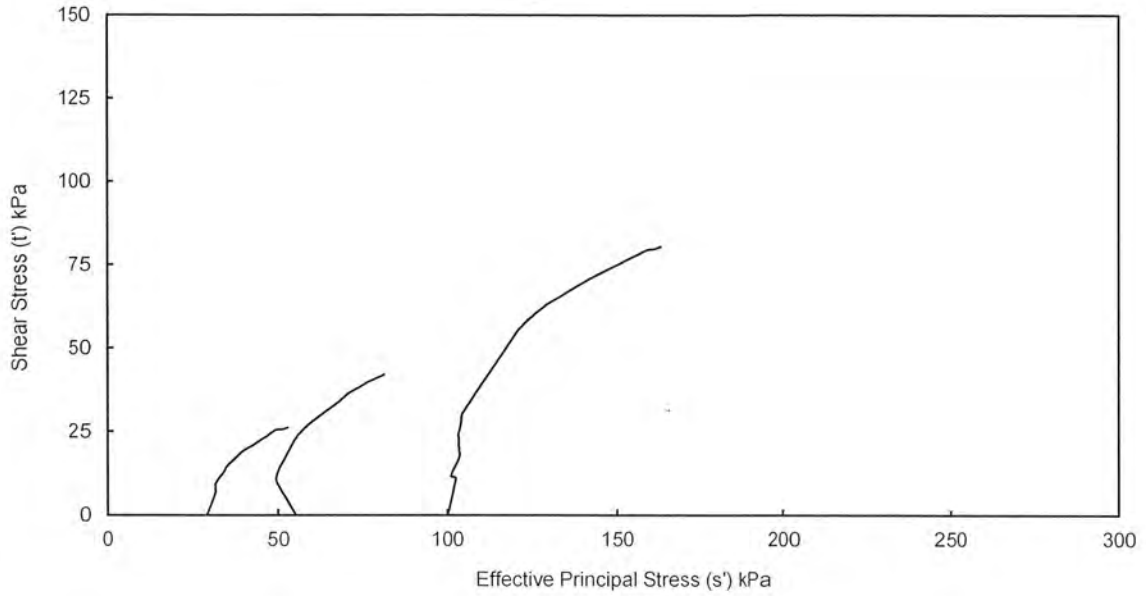
STAGE 3




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
	Engineer	-	Sample	U27
			Depth (m)	5.90
			Sample Type	U



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC012
	Engineer	-	Sample	U27
			Depth (m)	5.90
			Sample Type	U



Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	[Redacted] 07/07/2021		



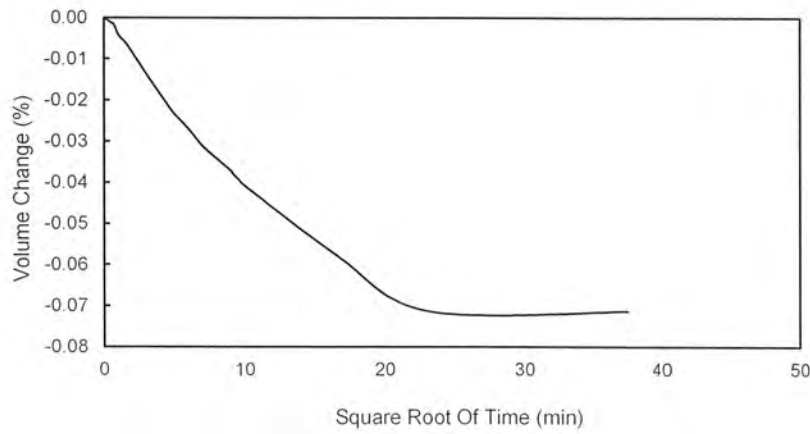
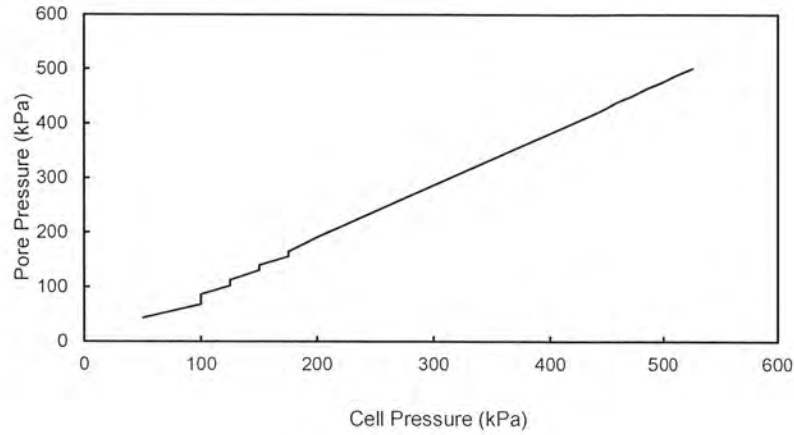
Version 028 - 15/03/2017  
 Effective Stress BH SBC013 03.50 U12 U - C7400-357154.xls ; Sample ID 357154  
 Unit 2 Springfield Road, Chesham, Bucks, HP5 1PW  
 Lab Project No C7400 : 19/06/2021 15:27:27

 SITE INVESTIGATION AND LABORATORY SERVICES		Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9			Contract No.	4322A		
		Client	Allied Exploration & Geotechnical Limited			Hole ID	BH SBC013		
		Engineer	-			Sample	U12		
Description		Soft intact dark grey slightly sandy very gravelly CLAY. Gravel is fine to coarse.							
<b>INITIAL CONDITIONS</b>									
Depth Within Original Sample	m	3.55-3.75							
Orientation Within Original Sample		Vertical							
Specimen Preparation		Undisturbed							
Hand Vane Top	kPa	102							
Hand Vane Bottom	kPa	174							
Diameter	mm	102.8							
Height	mm	201.1							
Moisture Content	%	11							
Bulk Density	Mg/m <sup>3</sup>	2.24							
Drainage Conditions		One end and radial boundary with side drains							
<b>SATURATION</b>									
Final Cell Pressure	kPa	525							
Final Pore Pressure	kPa	501							
Final Pore Pressure Parameter B		0.95							
Duration	day	5							
<b>CONSOLIDATION</b>		Stage No.	1	2	3				
Final Cell Pressure	kPa	525	550	600					
Back Pressure	kPa	500	500	500					
Effective Pressure	kPa	25	50	100					
Final Pore Pressure	kPa	499	497	500					
Final Pore Pressure Dissipation	%	100	100	100					
Duration	day	1	2	3					
<b>COMPRESSION</b>									
Cell Pressure	kPa	525	550	600					
Initial Pore Pressure	kPa	499	497	500					
Rate of Axial Displacement	mm/min	0.0024	0.0011	0.0025					
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>									
Pore Pressure	kPa	503	515	544					
Minor Effective Principal Stress	kPa	22	35	56					
Deviator Stress	kPa	54	87	141					
Major Effective Principal Stress	kPa	75	122	197					
Effective Principal Stress Ratio		3.5	3.5	3.5					
Axial Strain	%	1.9	1.8	2.0					
Corrections Applied to Deviator Stress	kPa	0.3	0.3	1.4					
Duration	day	2	3	2					
<b>EFFECTIVE STRESS PARAMETERS</b>									
Cohesion c'	kPa	1							
Angle of Shearing Resistance $\phi'$	degree	33.4							
<b>FINAL CONDITIONS</b>									
Moisture Content	%	11							
Bulk Density	Mg/m <sup>3</sup>	2.28							
Failure Mode	See Photograph								
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST                  WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120							
MDB	19/06/2021								



Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
Engineer	-	Sample	U12
		Depth (m)	3.50
		Sample Type	U

STAGE 1



Originator	Checked & Approved	<p><b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b></p> <p>BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120</p>	
MDB	19/06/2021		

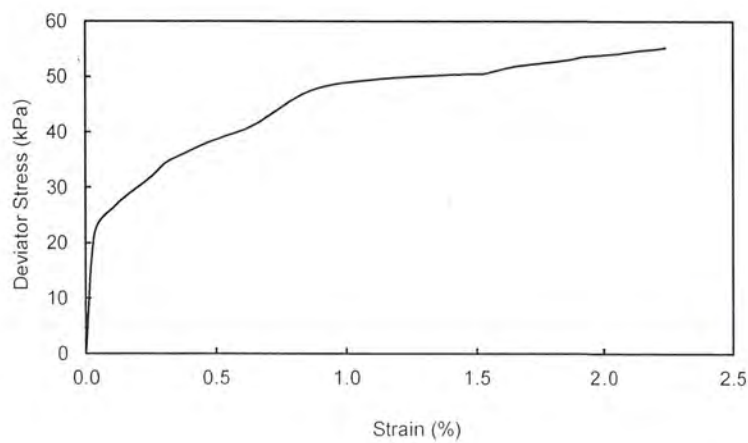
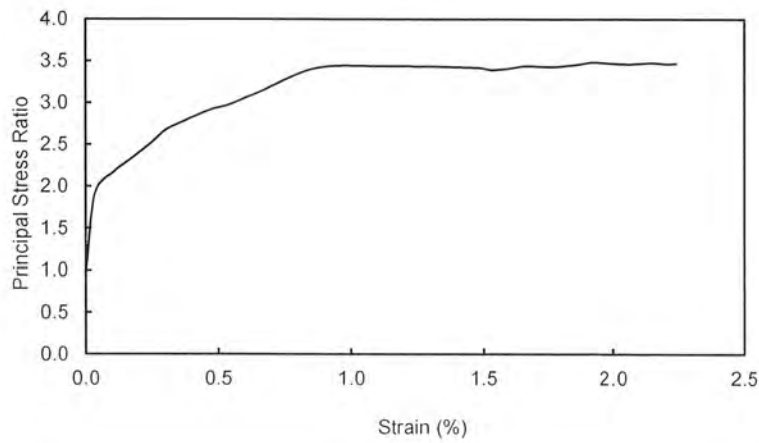
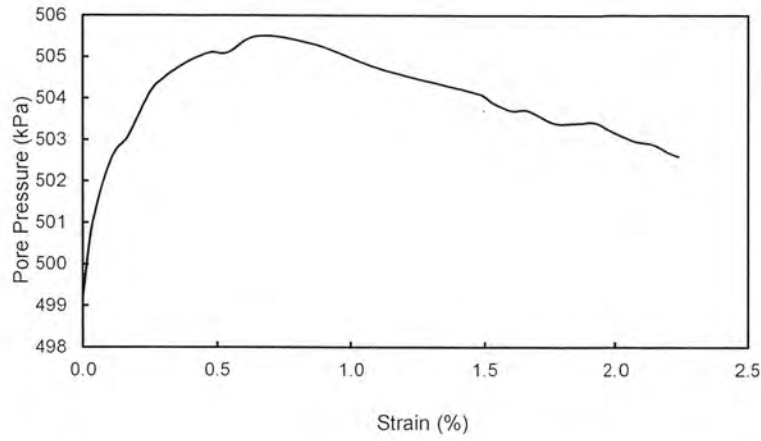





SITE INVESTIGATION AND LABORATORY SERVICES

Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
Engineer	-	Sample	U12
		Depth (m)	3.50
		Sample Type	U

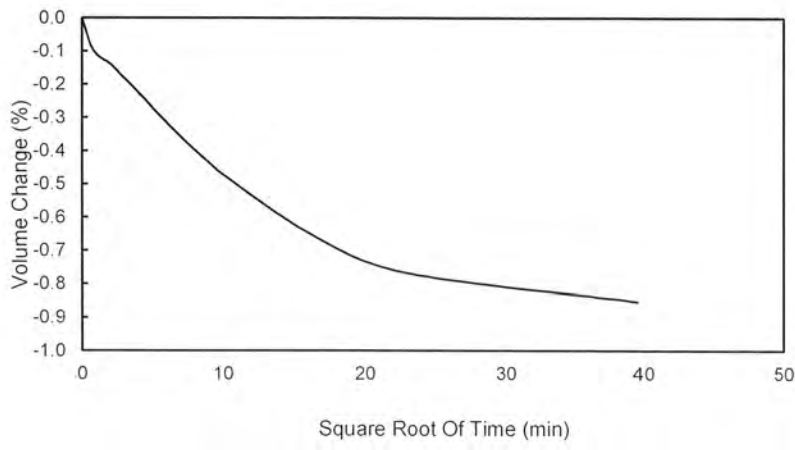
STAGE 1





Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
	Engineer	-	Sample	U12
			Depth (m)	3.50
			Sample Type	U

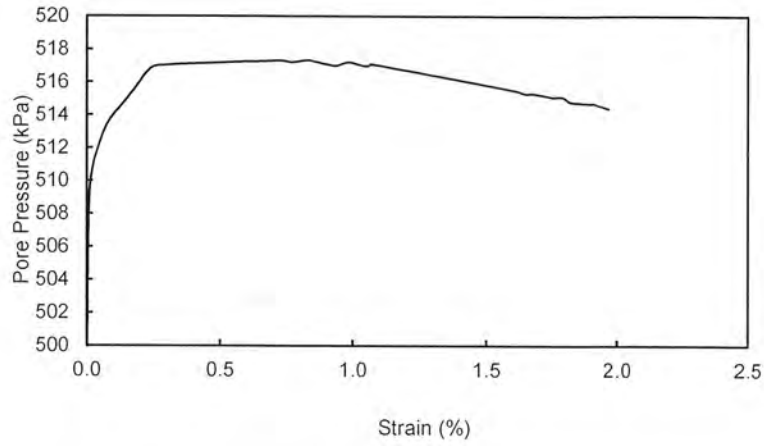
**STAGE 2**



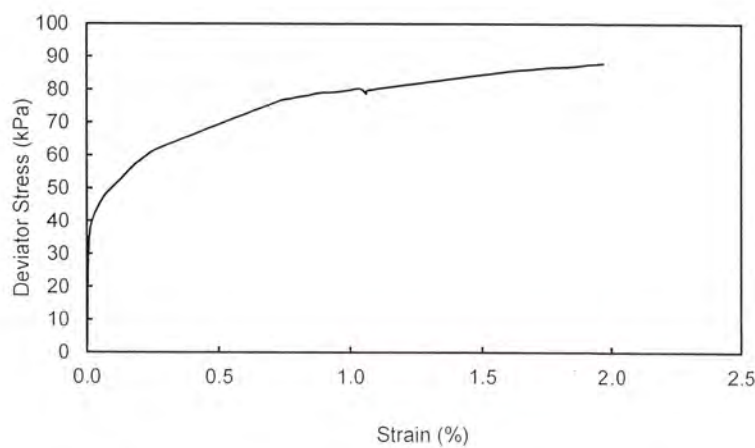
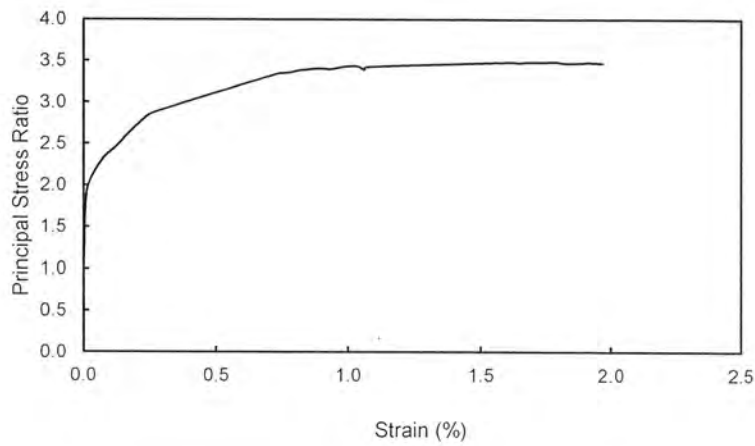
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MDB	 19/06/2021		





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
	Engineer	-	Sample	U12
			Depth (m)	3.50
			Sample Type	U



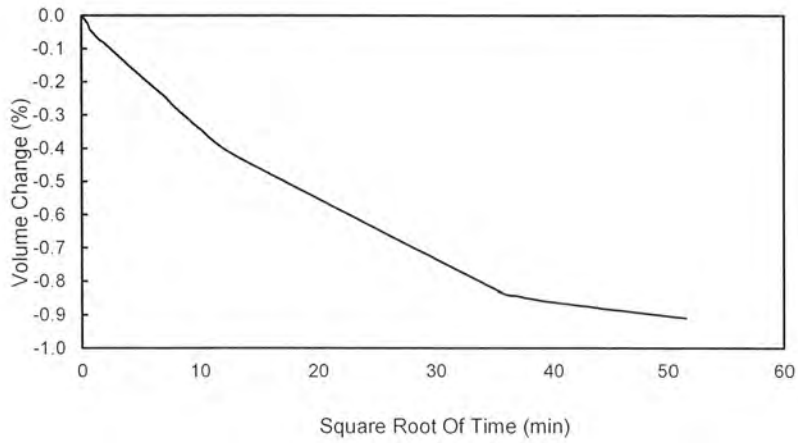
STAGE 2

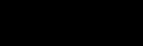



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		


 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID      BH SBC013 Sample        U12 Depth (m)    3.50 Sample Type   U
	Engineer     -	

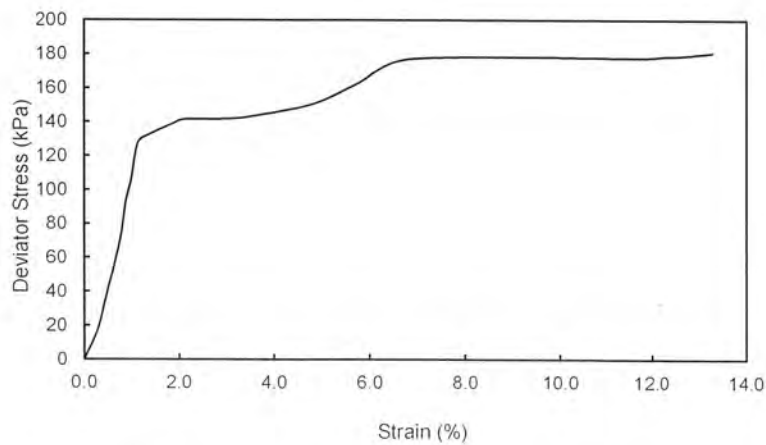
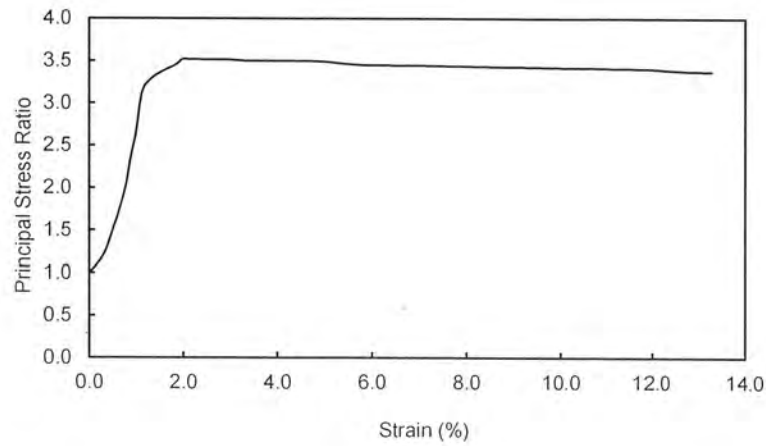
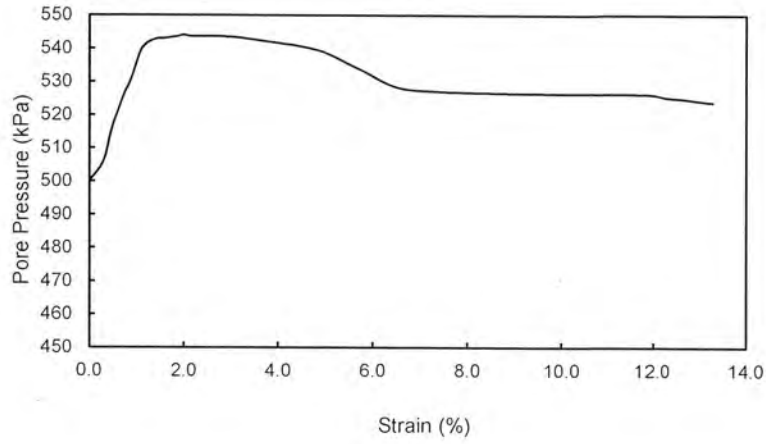
**STAGE 3**





Originator MDB	Checked & Approved  19/06/2021	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
			Sheet 6 of 8

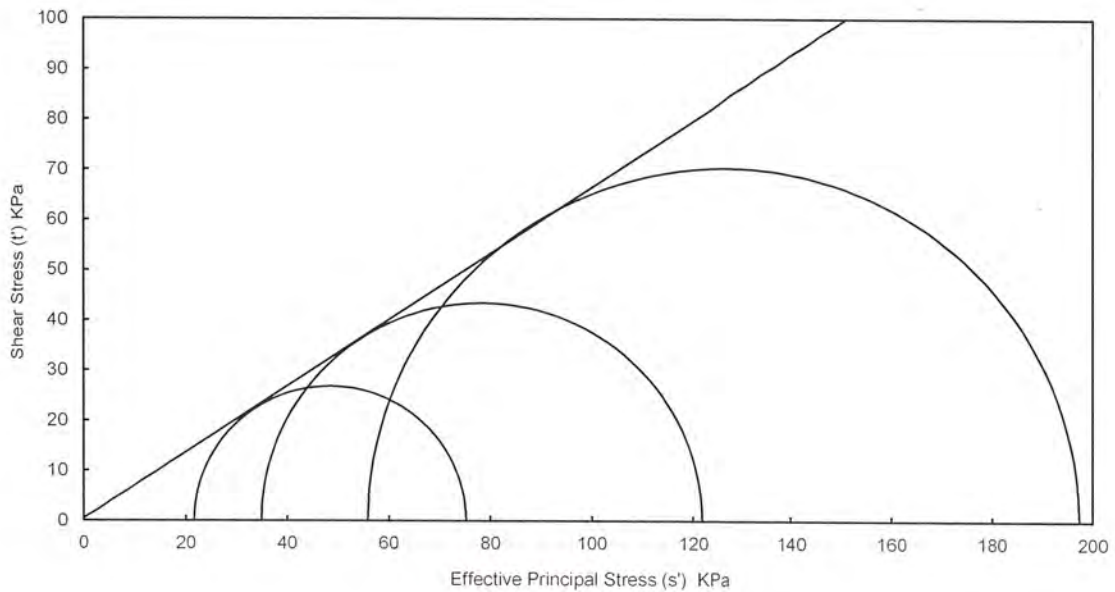
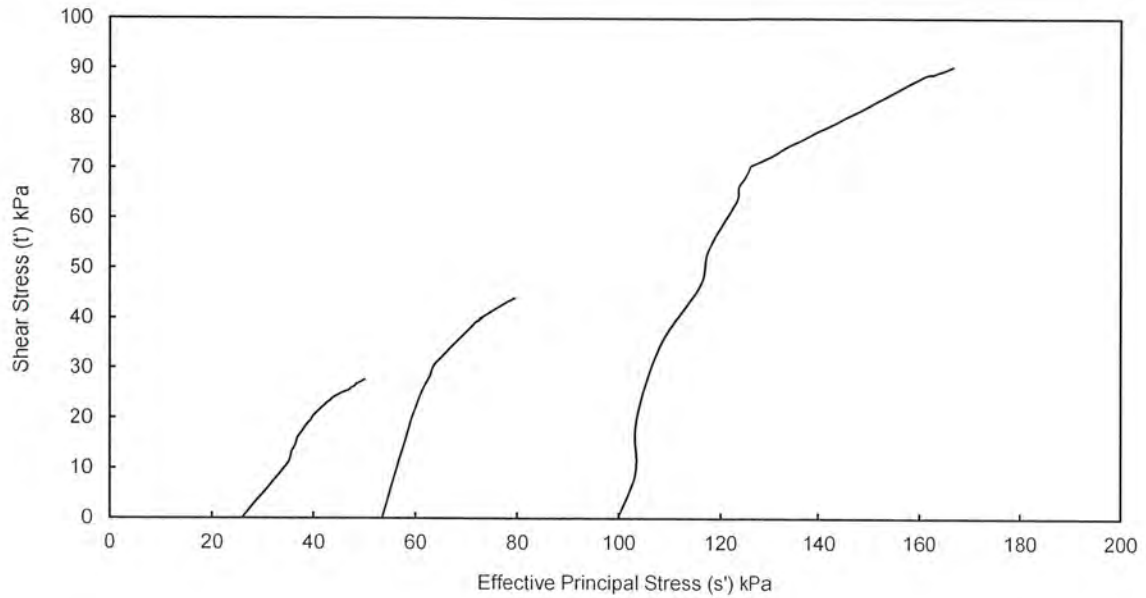



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
	Engineer	-	Sample	U12
			Depth (m)	3.50
			Sample Type	U



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		

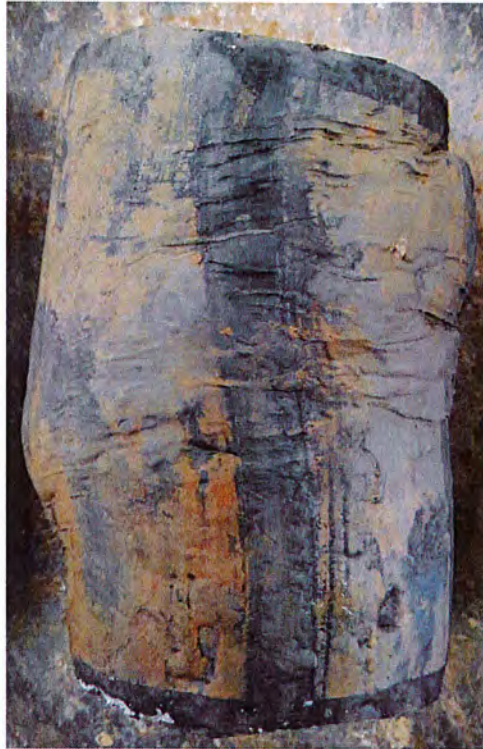
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
	Engineer	-	Sample	U12
			Depth (m)	3.50
			Sample Type	U



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		
			Sheet 8 of 8



<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC013
	Engineer	-	Sample	U12
			Depth (m)	3.50
			Sample Type	U



Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	19/06/2021		

# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,  
Pelton Fell, Chester le Street, DH2 2RG.

CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE

B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4322A      CLIENT : AMEY OW Limited

PROJECT : A66 North Trans Pennine Sceme C Section 9

HOLE : BH SBC017

SAMPLE No : U8

DEPTH (m) : 2.50

### TEST SPECIMEN PREPARATION

: Undisturbed  
Specific Depth (m) : 2.73  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

### TEST SPECIMEN DETAILS

	Stage No	1	2	3
Length	mm	200.5		
Diameter	mm	102.8		
Moisture Content	%	13.8		
Bulk Density	Mg/m <sup>3</sup>	2.26		

### SATURATION STAGE

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 325  
Final Pore Pressure kPa 314.4  
Final Pore Pressure Parameter B 0.992  
Duration day(s) 3

### CONSOLIDATION STAGE

	kPa	325	350	400
Cell Pressure	kPa	300	300	300
Back Pressure	kPa	25	50	100
Effective Pressure	kPa	300	300.4	300.6
Final Pore Pressure	kPa	1	2	2
Duration	day(s)			

### SHEARING STAGE

	kPa	325	350	400
Cell Pressure	kPa	0.0042	0.0042	0.0059
Rate of Axial Displacement	mm/min	14		
Final Moisture Content	%	2.26		
Final Bulk Density	Mg/m <sup>3</sup>			

### CONDITIONS AT FAILURE

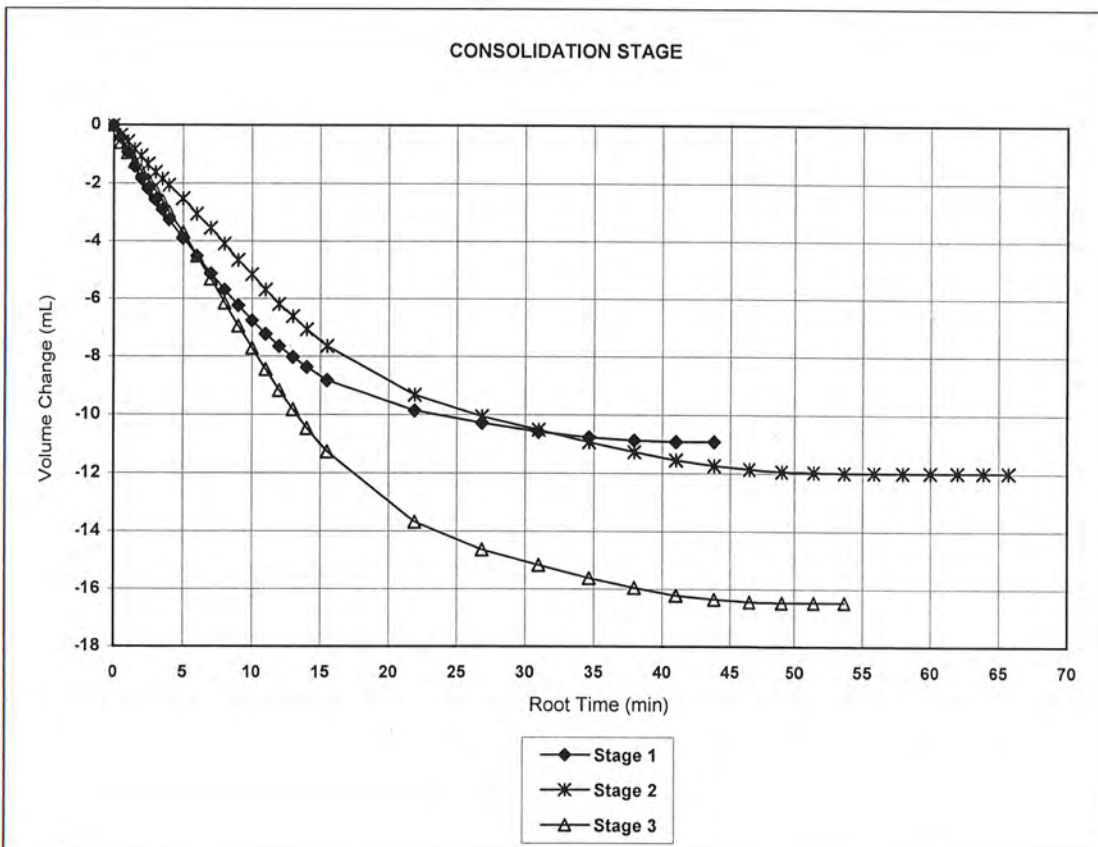
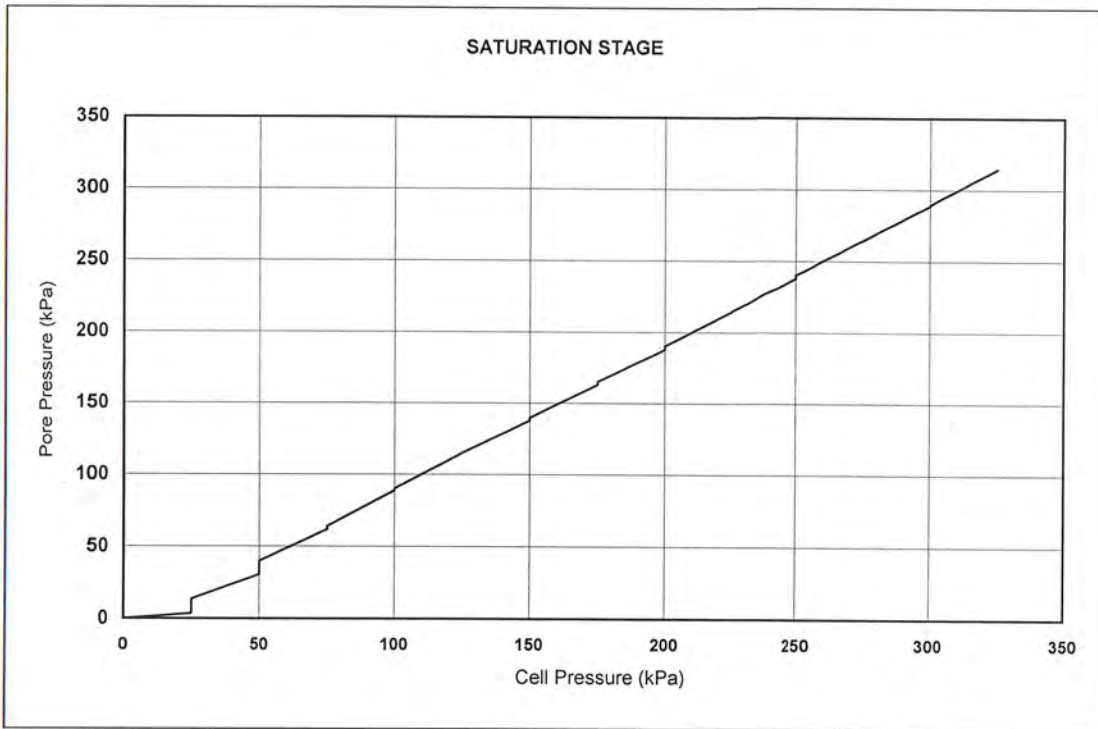
	Criterion	Maximum stress ratio		
Pore Pressure	kPa	296	306	324
Minor Effective Principal Stress	kPa	30	44	76
Deviator Stress	kPa	31	67	130
Major Effective Principal Stress	kPa	60	111	206
Effective Principal Stress Ratio		2.05	2.53	2.70
Pore Pressure Parameter A		-0.15	0.09	0.18
Axial Strain	%	2.3	3.6	7.3
Correction applied to Principal Stress	kPa	2.0	3.2	4.8
Duration	Days	1	1	4

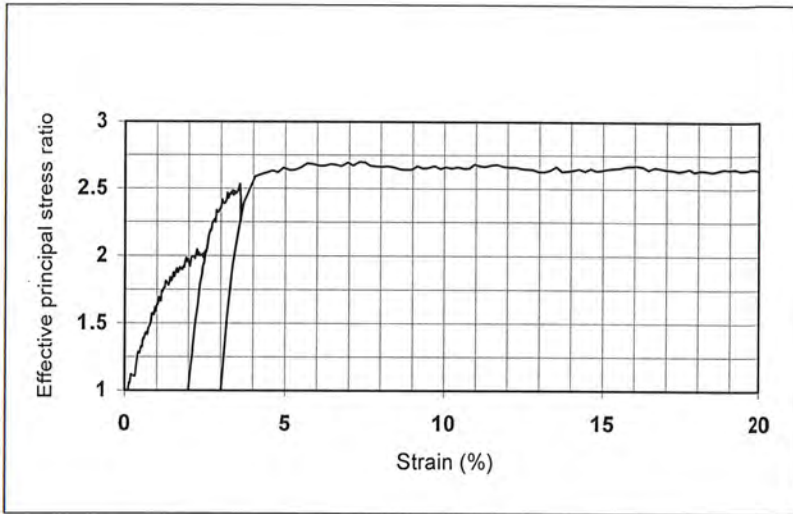
Apparent Cohesion c' 2

Angle of Shearing Resistance degrees 24

Sheet 1 of 4





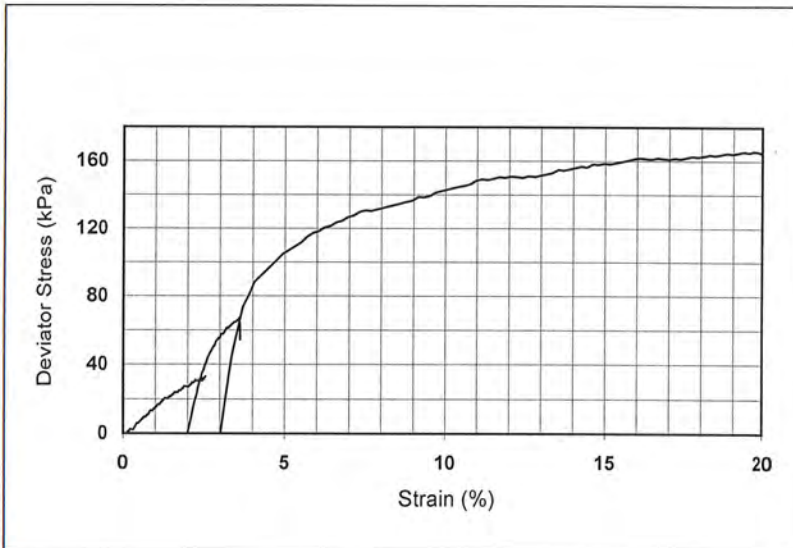


**Failure Conditions**

At maximum stress ratio

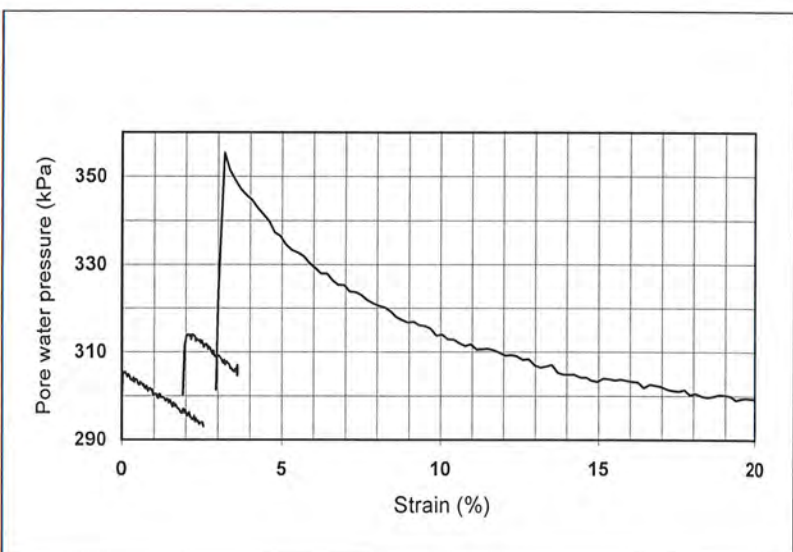
**Stage 1**

strain                      2.27 %  
 deviator stress          30.8 kPa  
 stress ratio              2.05



**Stage 2**

strain                      3.59 %  
 deviator stress          67.0 kPa  
 stress ratio              2.53



**Stage 3**

strain                      7.31 %  
 deviator stress          129.8 kPa  
 stress ratio              2.70



**FAILURE MODE**

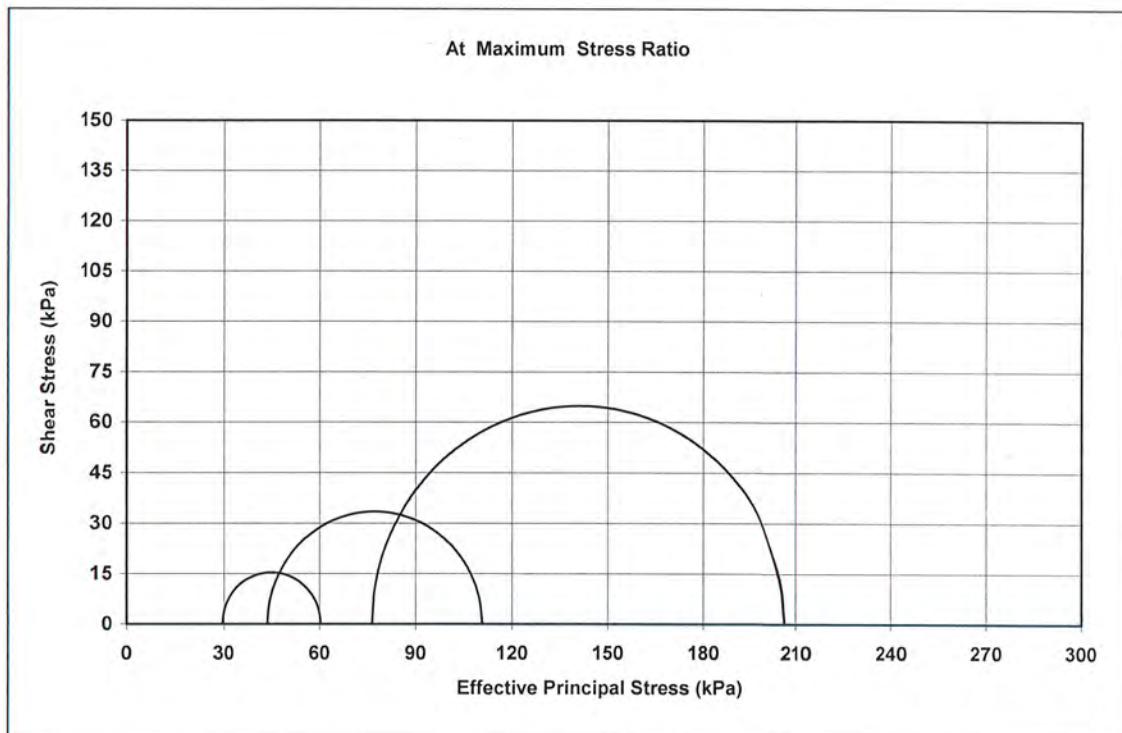
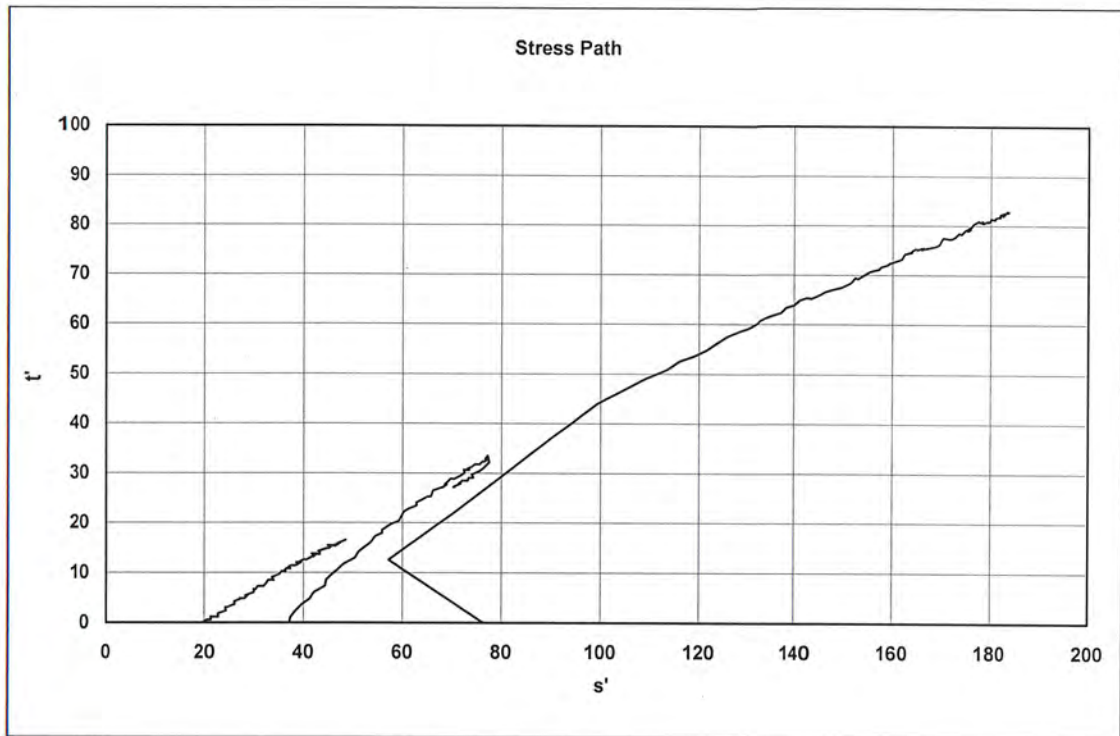




PROJECT No : 4322A      CLIENT : AMEY OW Limited

PROJECT : A66 North Trans Pennine Sceme C Section 9


HOLE : BH SBC017      SAMPLE No : U8

DEPTH (m) : 2.50

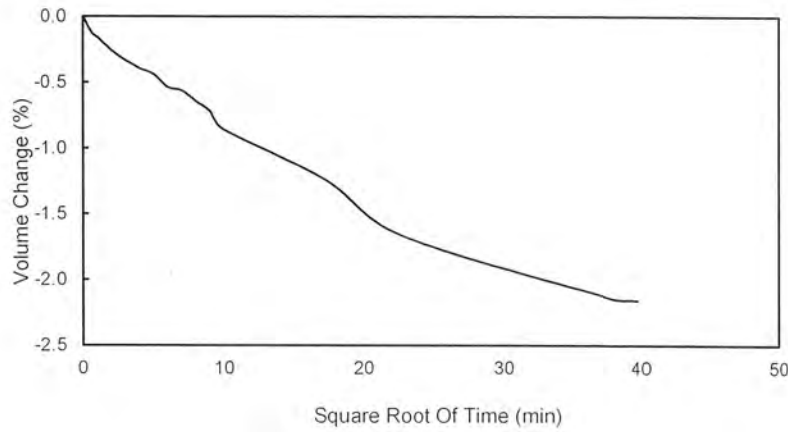
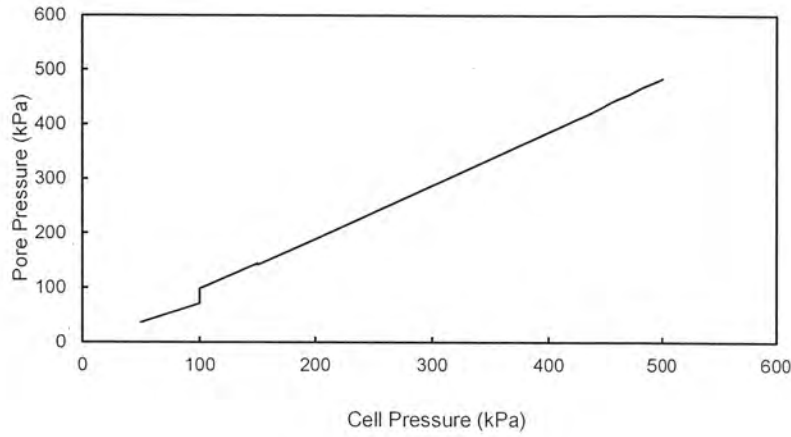



		Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9		Contract No. <b>4322A</b>	
		Client Allied Exploration & Geotechnical Limited		Hole ID BH SBC017 Sample U21 Depth (m) 7.00 Sample Type U	
Engineer -					
Description		Stiff intact dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse.			
<b>INITIAL CONDITIONS</b>					
Depth Within Original Sample	m	7.05-7.25			
Orientation Within Original Sample		Vertical			
Specimen Preparation		Undisturbed			
Hand Vane Top	kPa	205			
Hand Vane Bottom	kPa	115			
Diameter	mm	102.6			
Height	mm	202.1			
Moisture Content	%	14			
Bulk Density	Mg/m <sup>3</sup>	2.14			
Drainage Conditions		One end and radial boundary with side drains			
<b>SATURATION</b>					
Final Cell Pressure	kPa	500			
Final Pore Pressure	kPa	484			
Final Pore Pressure Parameter B		0.98			
Duration	day	3			
<b>CONSOLIDATION</b>		Stage No.	1	2	3
Final Cell Pressure	kPa	500	600	800	
Back Pressure	kPa	400	400	400	
Effective Pressure	kPa	100	200	400	
Final Pore Pressure	kPa	402	402	405	
Final Pore Pressure Dissipation	%	98	99	98	
Duration	day	1	3	7	
<b>COMPRESSION</b>					
Cell Pressure	kPa	500	600	800	
Initial Pore Pressure	kPa	402	402	405	
Rate of Axial Displacement	mm/min	0.0024	0.0019	0.0012	
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>					
Pore Pressure	kPa	458	507	584	
Minor Effective Principal Stress	kPa	42	93	216	
Deviator Stress	kPa	85	190	388	
Major Effective Principal Stress	kPa	128	283	604	
Effective Principal Stress Ratio		3.0	3.0	2.8	
Axial Strain	%	3.6	3.0	8.4	
Corrections Applied to Deviator Stress	kPa	0.5	0.5	1.0	
Duration	day	2	3	11	
<b>EFFECTIVE STRESS PARAMETERS</b>					
Cohesion c'	kPa	6			
Angle of Shearing Resistance $\phi'$	degree	27.7			
<b>FINAL CONDITIONS</b>					
Moisture Content	%	12			
Bulk Density	Mg/m <sup>3</sup>	2.24			
Failure Mode		See Photograph			
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120			
MDB	07.07.2021				




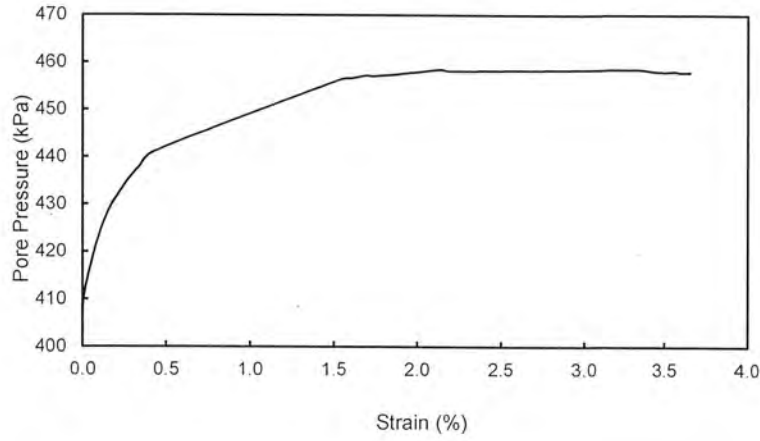
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U

STAGE 1

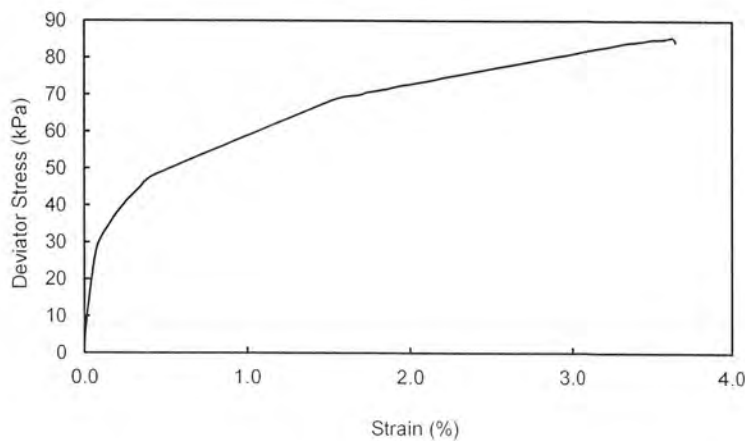
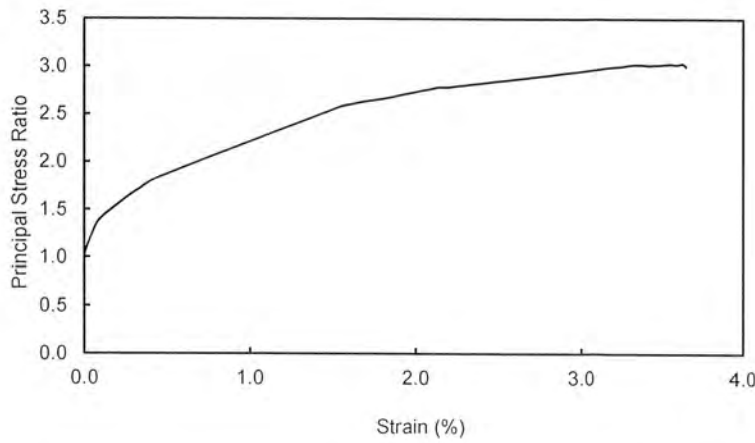



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U




STAGE 1

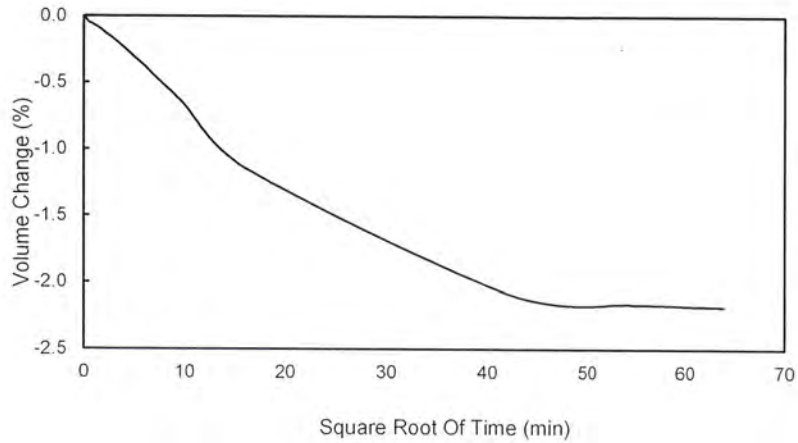



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U

STAGE 2



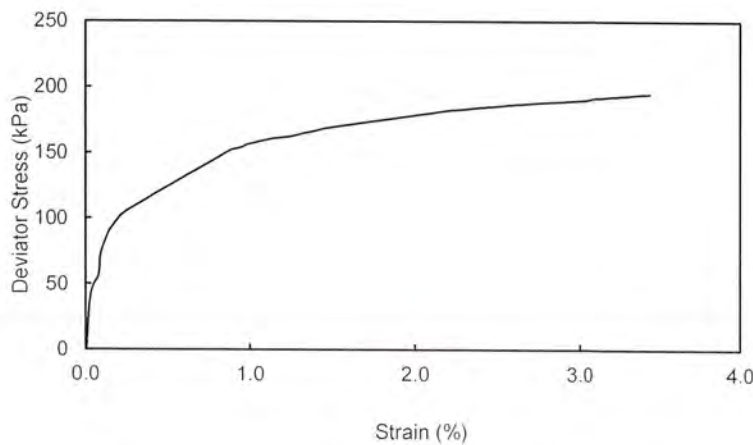
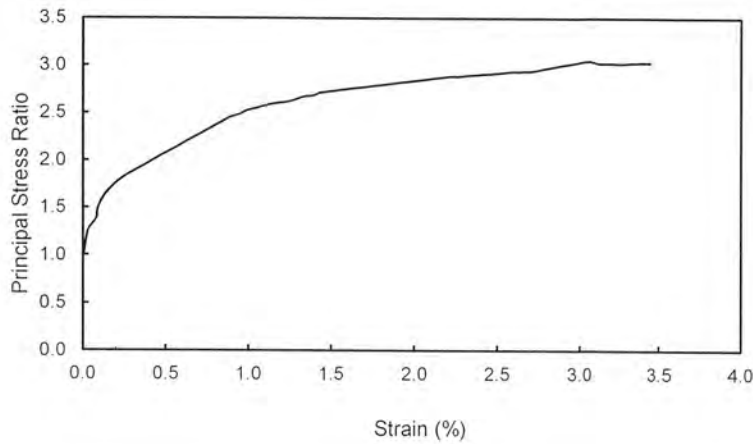
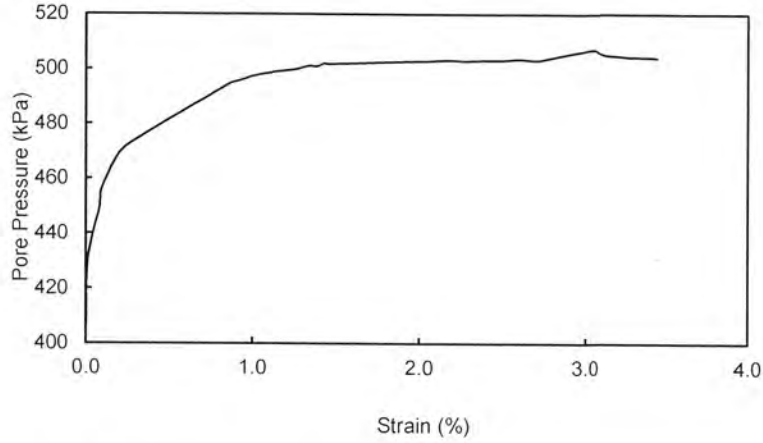
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



SITE INVESTIGATION AND LABORATORY SERVICES

Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
Engineer	-	Sample	U21
		Depth (m)	7.00
		Sample Type	U


STAGE 2



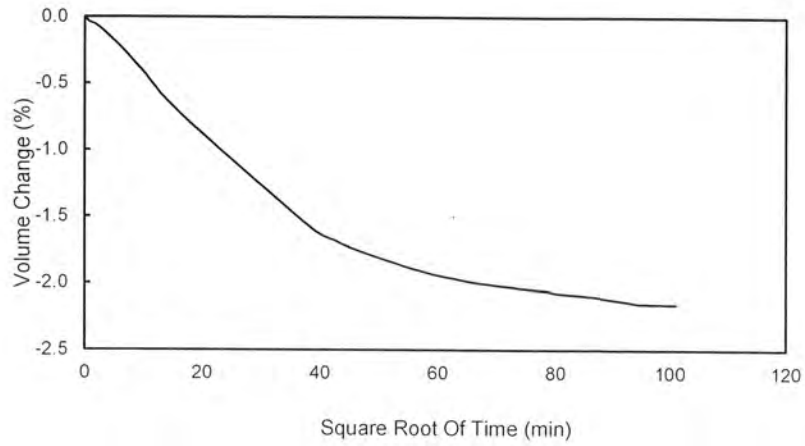
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MDB	07/07/2021	







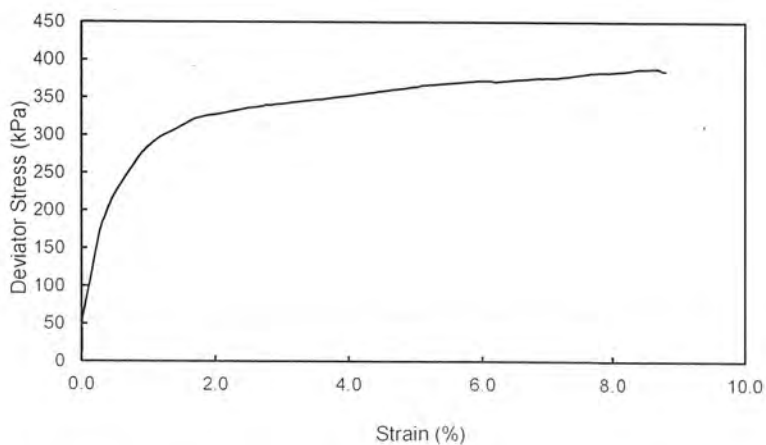
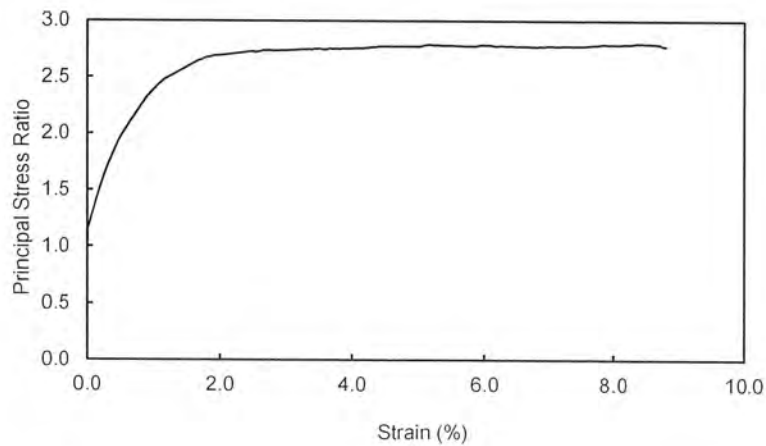
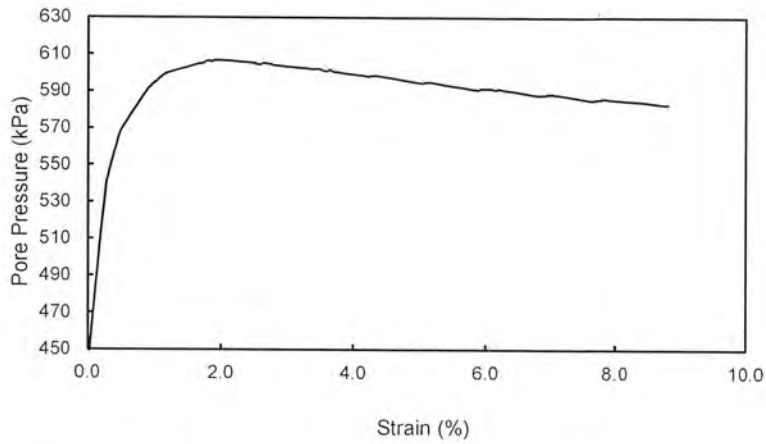
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	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U


**STAGE 3**



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		

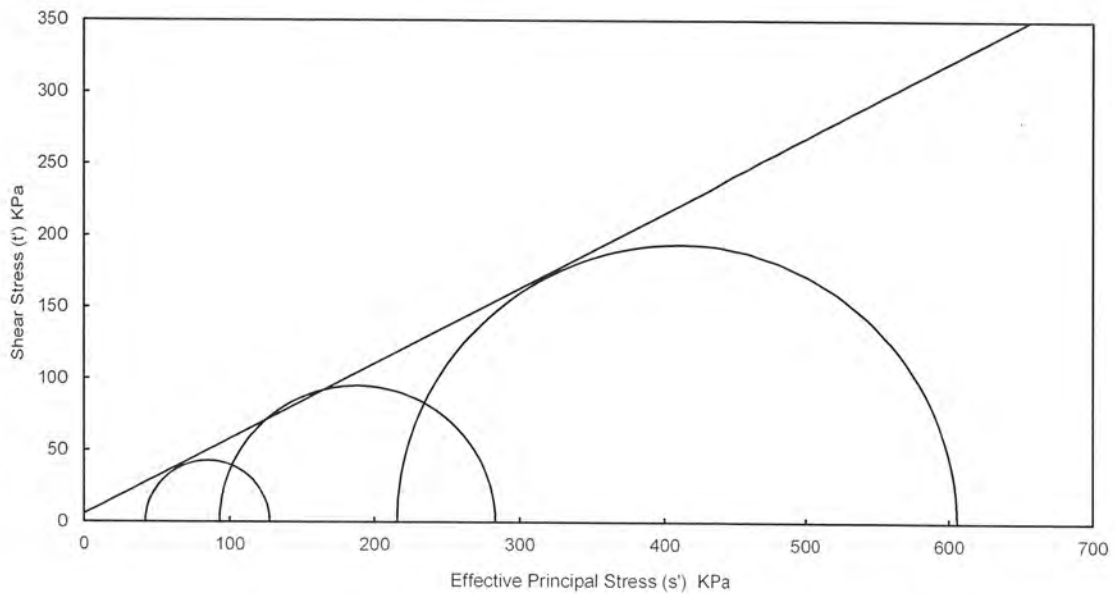
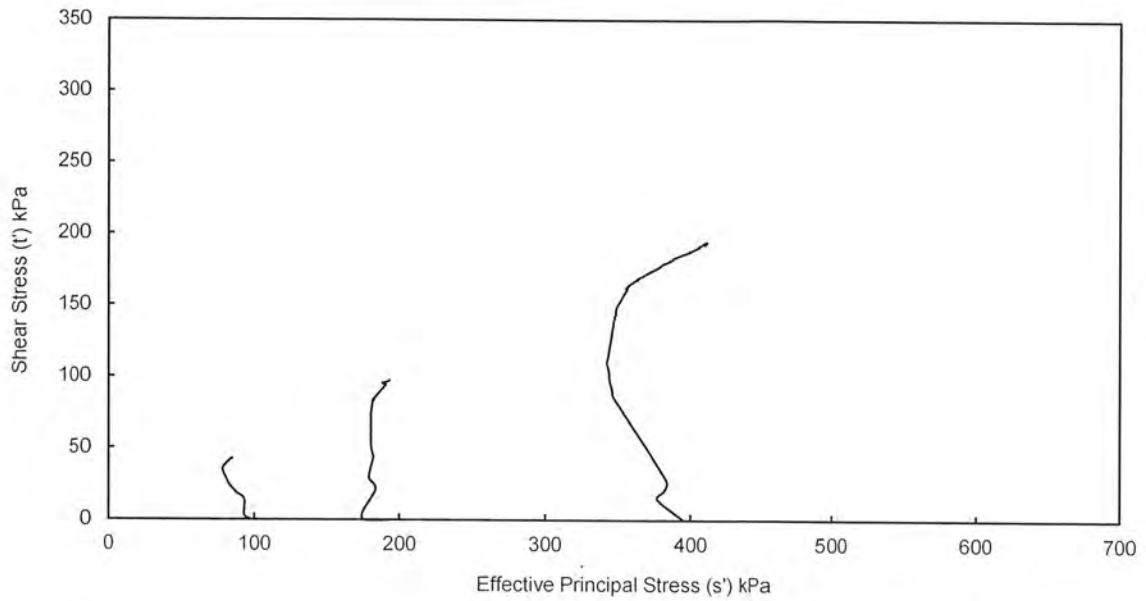
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		




<b>TERRA TEK</b> SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC017 Sample U21 Depth (m) 7.00 Sample Type U
	Engineer -	





Originator MDB	Checked & Approved [Redacted Signature] 07/07/2021	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
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 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC017
	Engineer	-	Sample	U21
			Depth (m)	7.00
			Sample Type	U



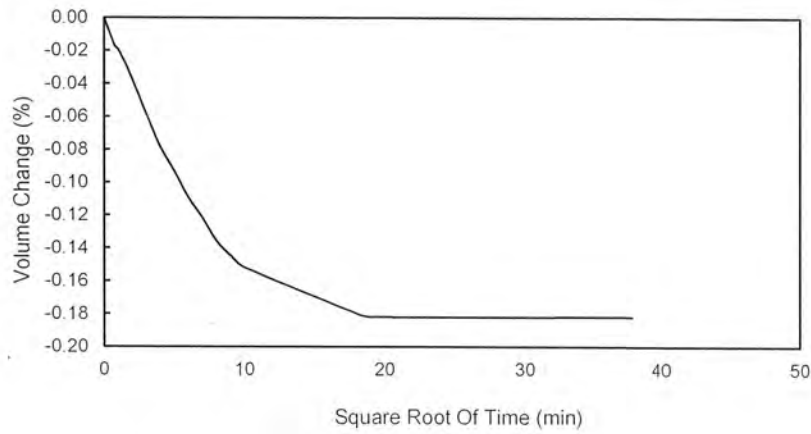
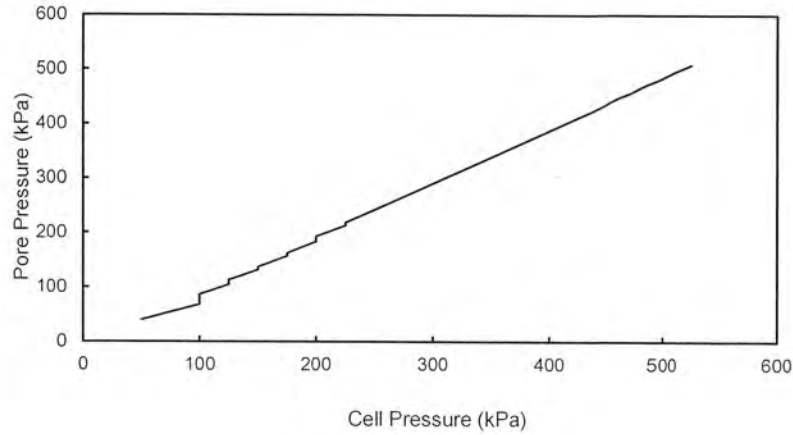
Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	[Redacted] 07/07/2021		




		Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9			Contract No.	4322A	
		Client	Allied Exploration & Geotechnical Limited			Hole ID	BH SBC021	
		Engineer				Sample	U15	
Description		Firm intact grey slightly sandy gravelly CLAY. Gravel is fine to coarse.					Depth (m)	3.20
Sample Type							Sample Type	U
<b>INITIAL CONDITIONS</b>								
Depth Within Original Sample	m	3.25-3.45						
Orientation Within Original Sample		Vertical						
Specimen Preparation		Undisturbed						
Hand Vane Top	kPa	130						
Hand Vane Bottom	kPa	131						
Diameter	mm	102.2						
Height	mm	202.8						
Moisture Content	%	12						
Bulk Density	Mg/m <sup>3</sup>	2.21						
Drainage Conditions		One end and radial boundary with side drains						
<b>SATURATION</b>								
Final Cell Pressure	kPa	525						
Final Pore Pressure	kPa	509						
Final Pore Pressure Parameter B		0.97						
Duration	day	7						
<b>CONSOLIDATION</b>								
	Stage No.	1	2	3				
Final Cell Pressure	kPa	525	550	600				
Back Pressure	kPa	500	500	500				
Effective Pressure	kPa	25	50	100				
Final Pore Pressure	kPa	499	500	504				
Final Pore Pressure Dissipation	%	100	100	95				
Duration	day	1	2	5				
<b>COMPRESSION</b>								
Cell Pressure	kPa	525	550	600				
Initial Pore Pressure	kPa	499	500	504				
Rate of Axial Displacement	mm/min	0.00160	0.00813	0.00110				
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>								
Pore Pressure	kPa	513	521	540				
Minor Effective Principal Stress	kPa	13	29	60				
Deviator Stress	kPa	39	79	153				
Major Effective Principal Stress	kPa	52	108	213				
Effective Principal Stress Ratio		4.1	3.7	3.6				
Axial Strain	%	1.5	1.9	3.9				
Corrections Applied to Deviator Stress	kPa	0.3	0.3	0.6				
Duration	day	2	4	6				
<b>EFFECTIVE STRESS PARAMETERS</b>								
Cohesion c'	kPa	3						
Angle of Shearing Resistance $\phi'$	degree	33.0						
<b>FINAL CONDITIONS</b>								
Moisture Content	%	12						
Bulk Density	Mg/m <sup>3</sup>	2.25						
Failure Mode		See Photograph						
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120						
MDB	09/07/2021							
Sheet 1 of 8								


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID BH SBC021 Sample U15 Depth (m) 3.20 Sample Type U
	Engineer	-	

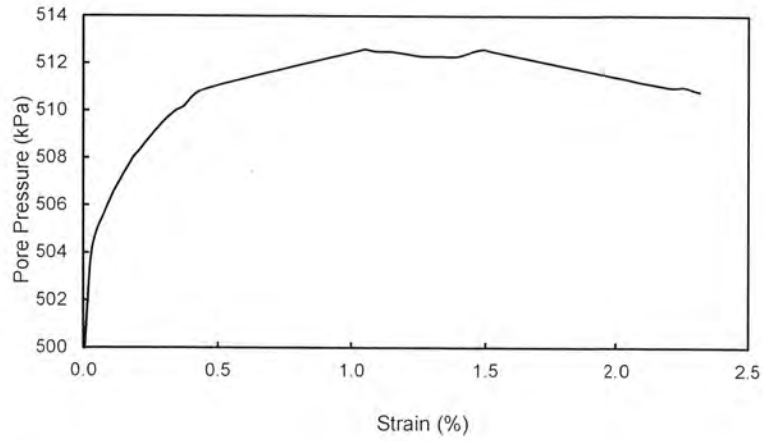
STAGE 1



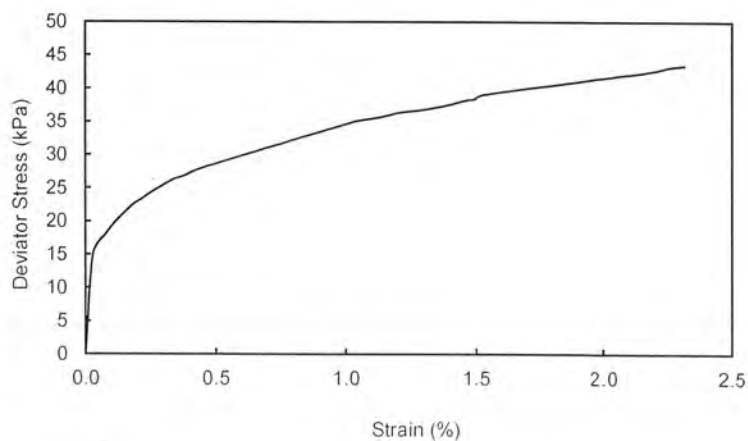
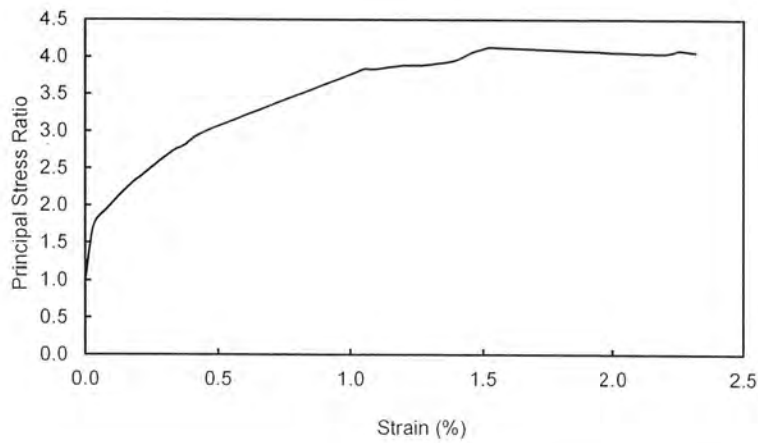
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MDB	09/07/2021		





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID BH SBC021 Sample U15 Depth (m) 3.20 Sample Type U
	Engineer	-	



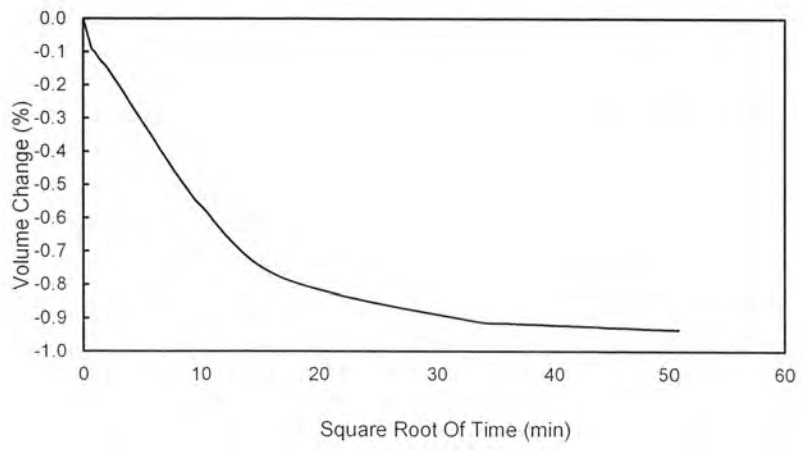
STAGE 1




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> PS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	09/07/2021		


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
	Engineer	-	Sample	U15
			Depth (m)	3.20
			Sample Type	U

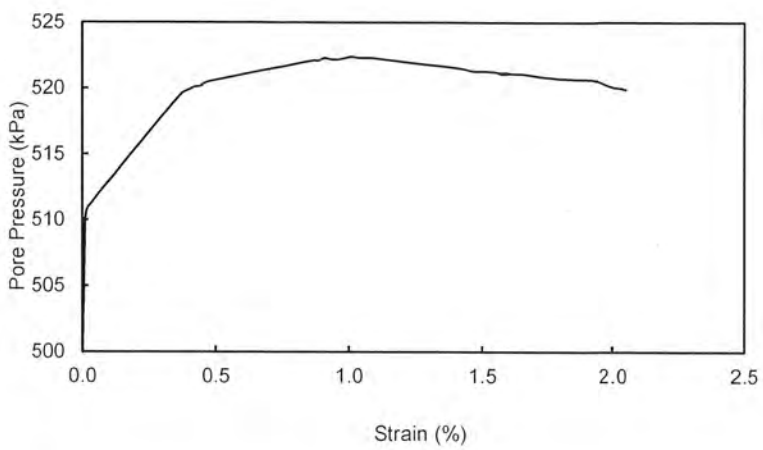
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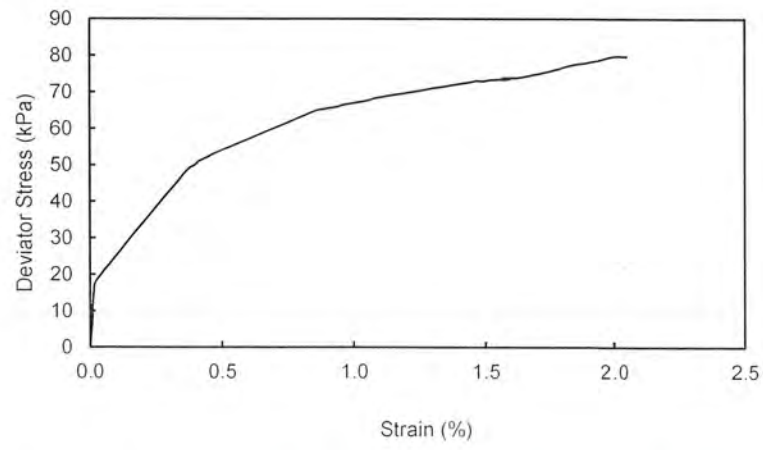
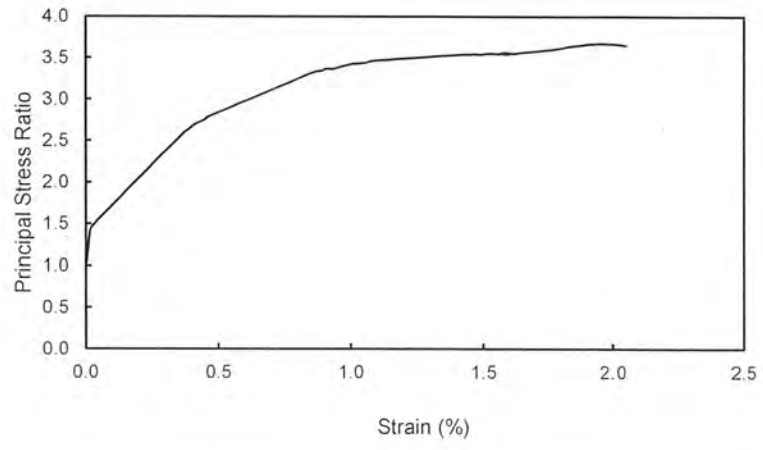
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	09/07/2021		





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
	Engineer	-	Sample	U15
			Depth (m)	3.20
			Sample Type	U



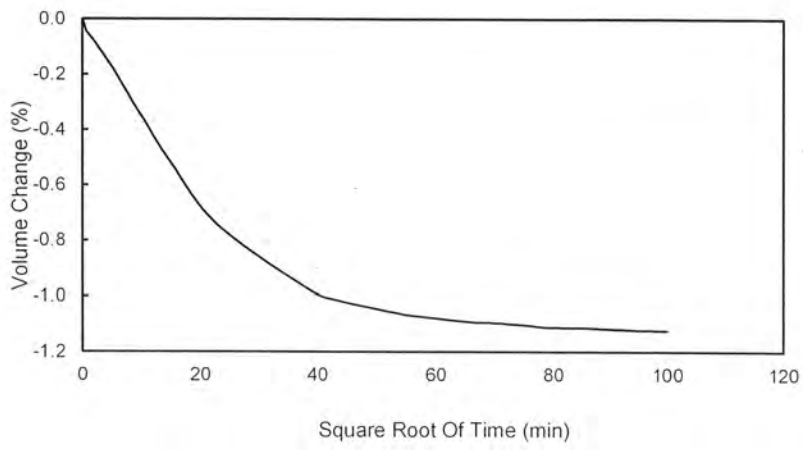
**STAGE 2**




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	09/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
	Engineer	-	Sample	U15
			Depth (m)	3.20
			Sample Type	U

**STAGE 3**

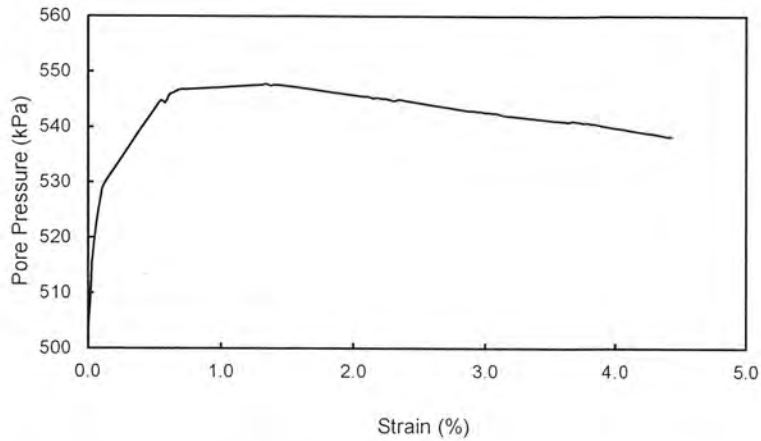


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MDB	09/07/2021		
			Sheet 6 of 8

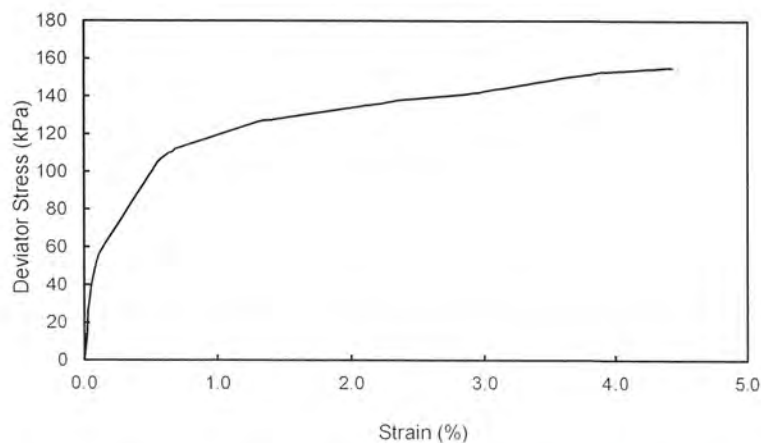
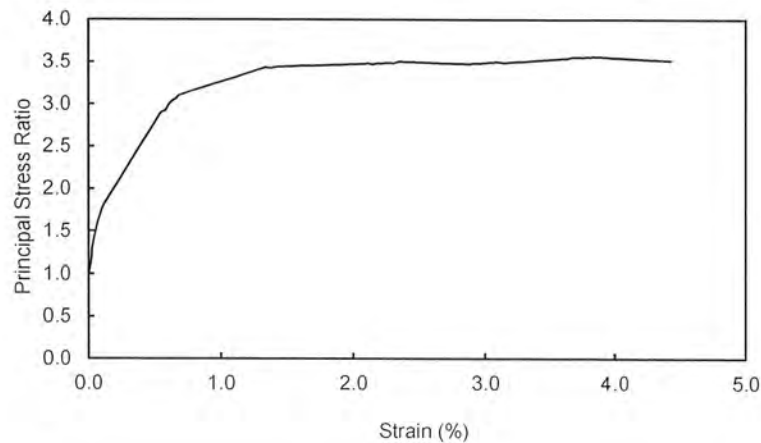





Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
Engineer	-	Sample	U15
		Depth (m)	3.20
		Sample Type	U

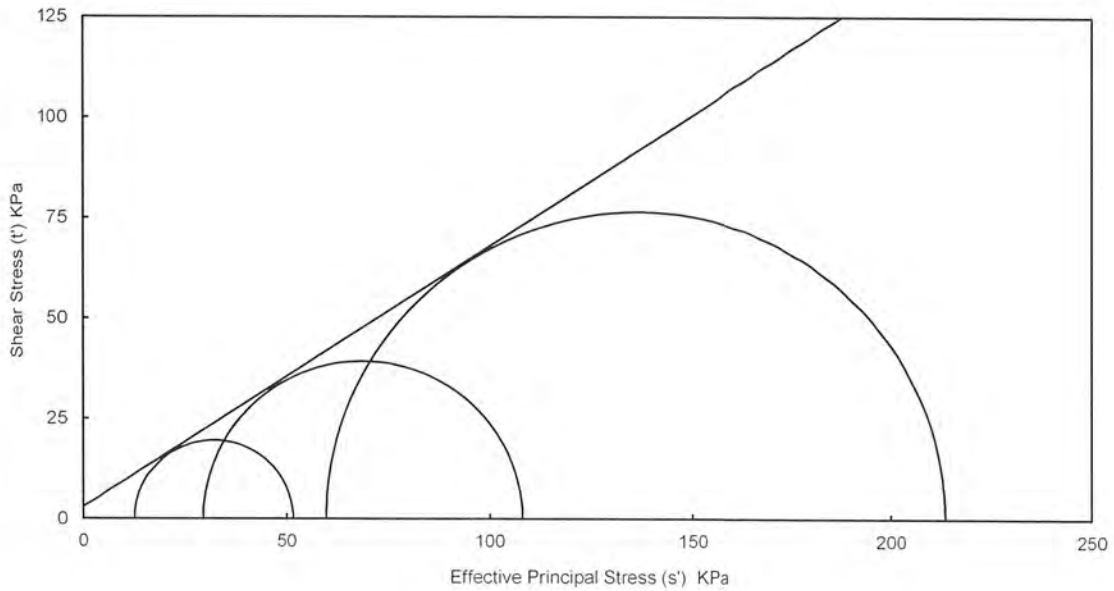
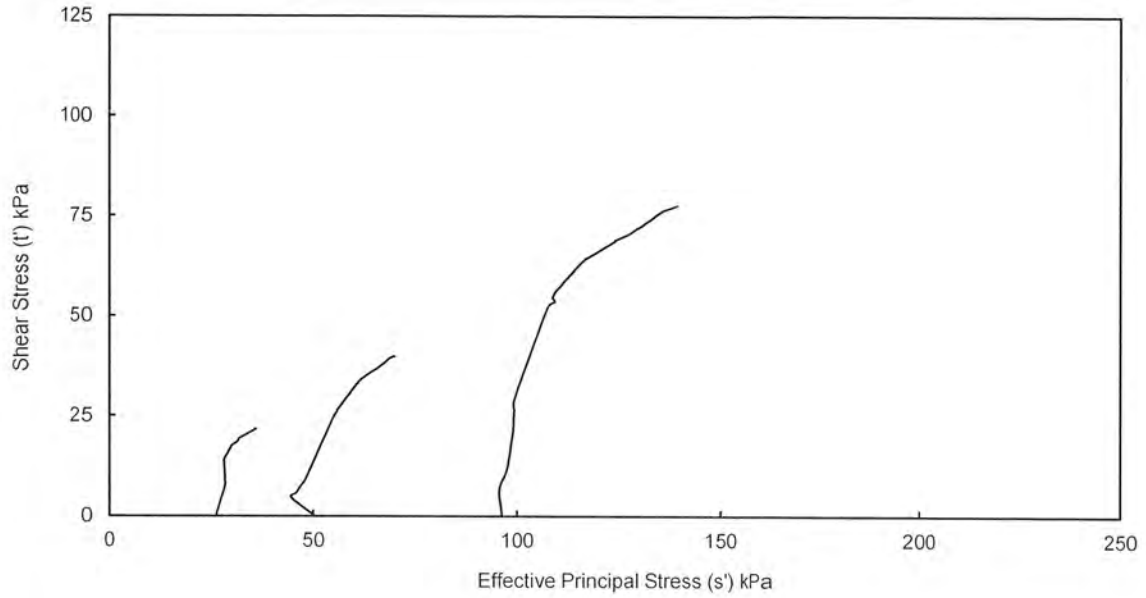



STAGE 3



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	09/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
	Engineer	-	Sample	U15
			Depth (m)	3.20
			Sample Type	U



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	09/07/2021		





<b>TERRA TEK</b> SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC021
	Engineer	-	Sample	U15
			Depth (m)	3.20
			Sample Type	U



Originator	Checked & Approved
MDB	[Redacted]
	09/07/2021

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.



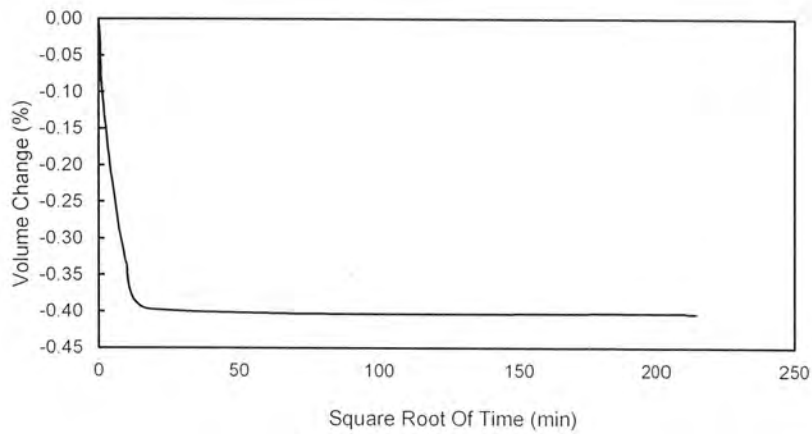
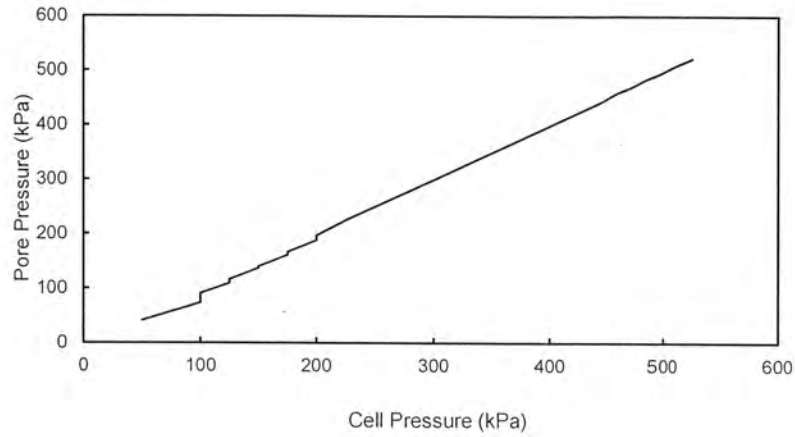
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		Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC024	Sample U5	
		Engineer	Depth (m) 1.50	Sample Type U	
Description		Firm intact dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse.			
<b>INITIAL CONDITIONS</b>					
Depth Within Original Sample	m	1.55-1.75			
Orientation Within Original Sample		Vertical			
Specimen Preparation		Undisturbed			
Hand Vane Top	kPa	118			
Hand Vane Bottom	kPa	165			
Diameter	mm	102.6			
Height	mm	202.0			
Moisture Content	%	13			
Bulk Density	Mg/m <sup>3</sup>	2.14			
Drainage Conditions		One end and radial boundary with side drains			
<b>SATURATION</b>					
Final Cell Pressure	kPa	525			
Final Pore Pressure	kPa	522			
Final Pore Pressure Parameter B		0.99			
Duration	day	6			
<b>CONSOLIDATION</b>		Stage No.	1	2	3
Final Cell Pressure	kPa		525	550	600
Back Pressure	kPa		500	500	500
Effective Pressure	kPa		25	50	100
Final Pore Pressure	kPa		500	501	498
Final Pore Pressure Dissipation	%		95	96	100
Duration	day		1	2	2
<b>COMPRESSION</b>					
Cell Pressure	kPa		525	550	600
Initial Pore Pressure	kPa		500	501	498
Rate of Axial Displacement	mm/min		0.0016	0.0008	0.0015
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>					
Pore Pressure	kPa		508	515	537
Minor Effective Principal Stress	kPa		17	35	63
Deviator Stress	kPa		48	88	147
Major Effective Principal Stress	kPa		65	123	210
Effective Principal Stress Ratio			3.9	3.5	3.3
Axial Strain	%		1.5	1.5	2.2
Corrections Applied to Deviator Stress	kPa		0.3	0.2	0.4
Duration	day		2	4	3
<b>EFFECTIVE STRESS PARAMETERS</b>					
Cohesion c'	kPa		4		
Angle of Shearing Resistance Ø'	degree		31.0		
<b>FINAL CONDITIONS</b>					
Moisture Content	%		13		
Bulk Density	Mg/m <sup>3</sup>		2.18		
Failure Mode		See Photograph			
Originator	Checked &	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST                  WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120			
MDB	07/07/2021				
					Sheet 1 of 3





Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
Engineer	-	Sample	U5
		Depth (m)	1.50
		Sample Type	U

STAGE 1



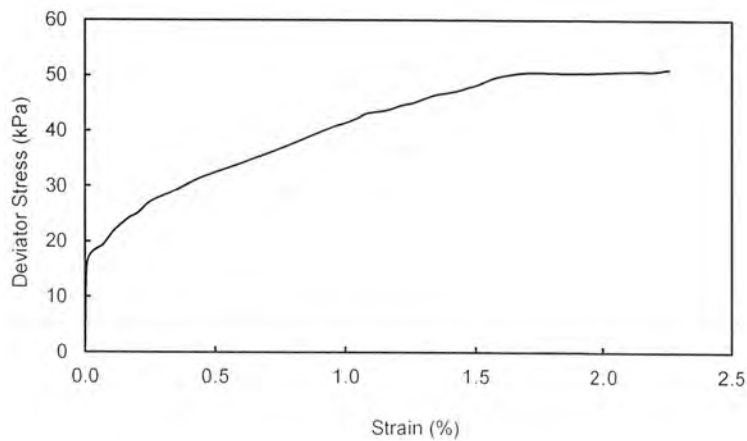
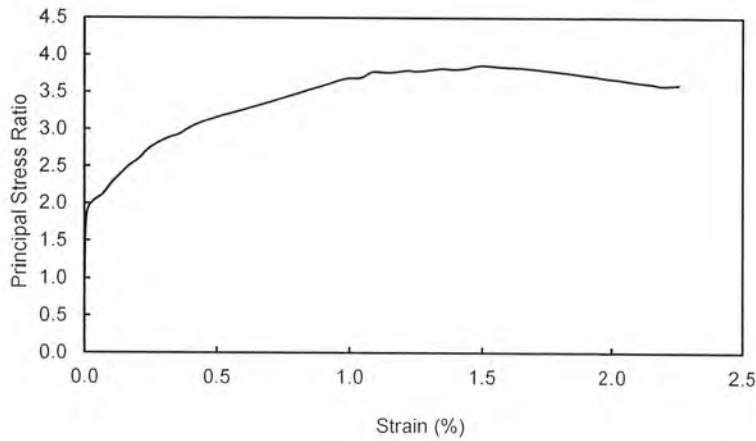
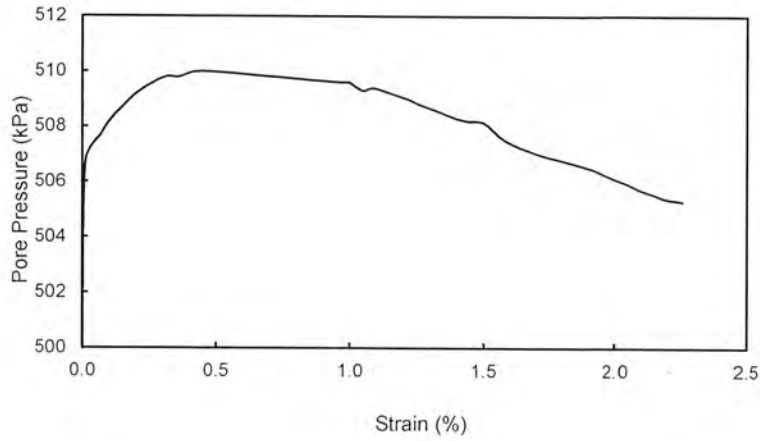
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	[Redacted]		
	07/07/2021		Sheet 2 of 8



SITE INVESTIGATION AND LABORATORY SERVICES


Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
Engineer	-	Sample	U5
		Depth (m)	1.50
		Sample Type	U

STAGE 1

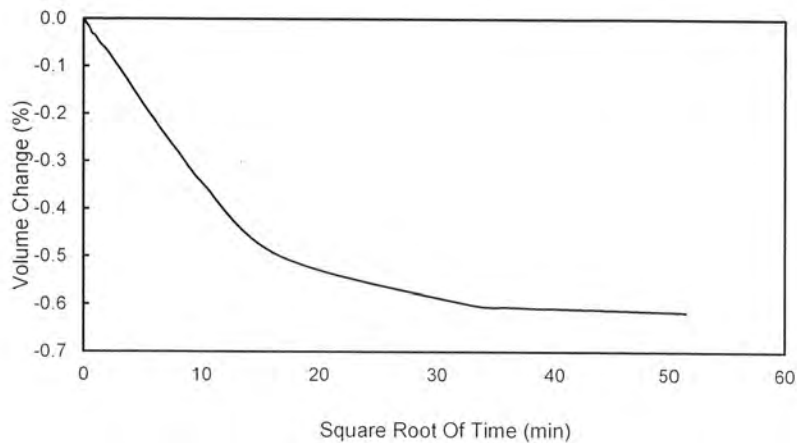



Originator	Checked & Approved	<p><b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b>                  PS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120</p>	
MDB	[Redacted]		




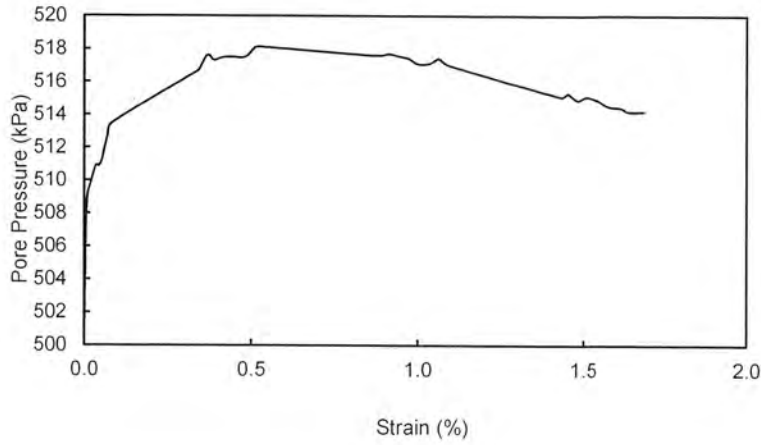
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
	Engineer	-	Sample	U5
			Depth (m)	1.50
			Sample Type	U

STAGE 2

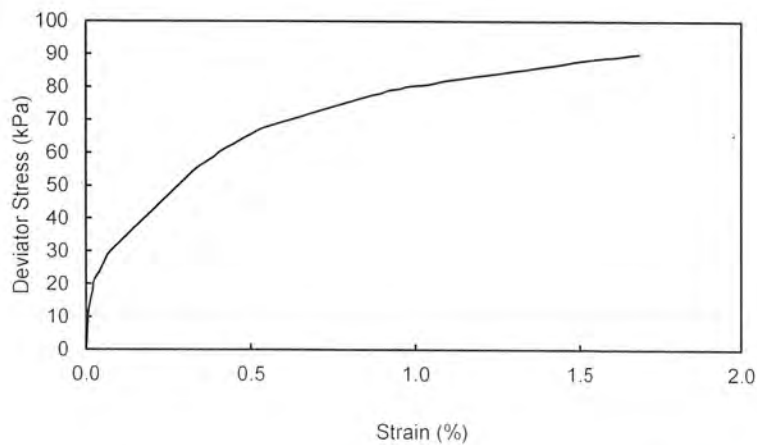
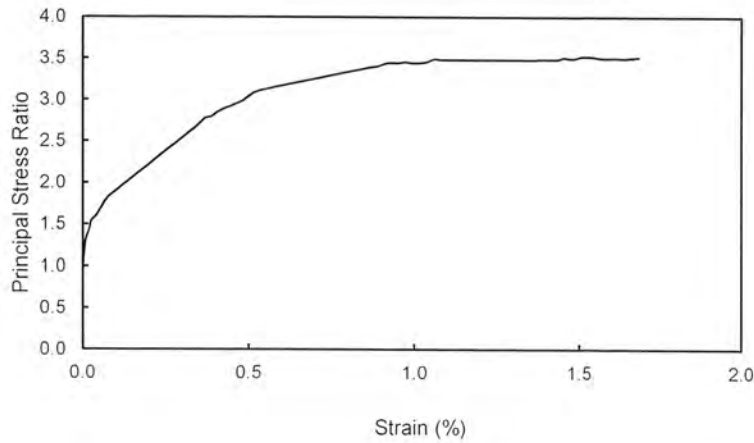



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
	Engineer	-	Sample	U5
			Depth (m)	1.50
			Sample Type	U




STAGE 2

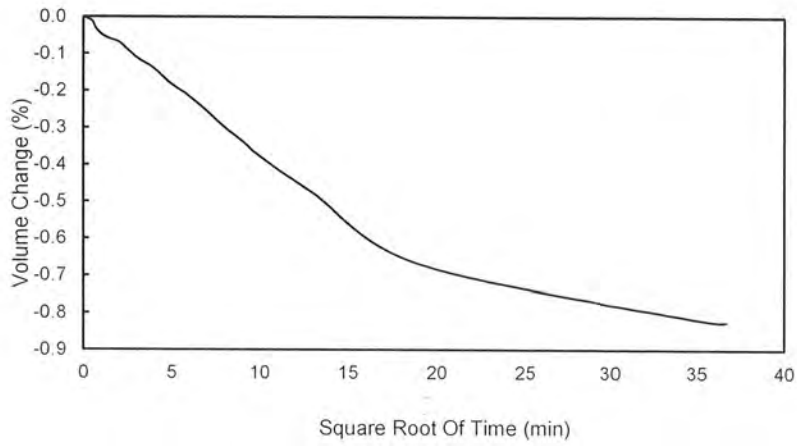



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		




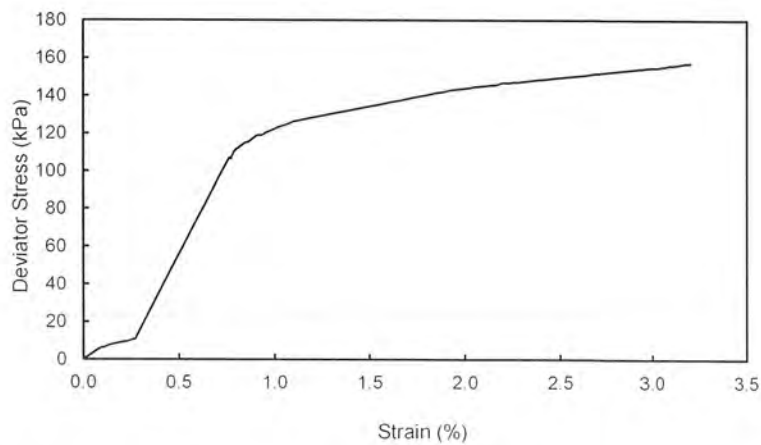
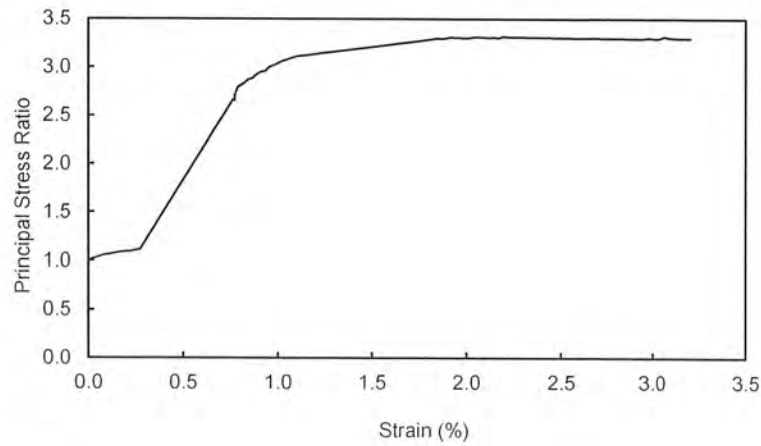
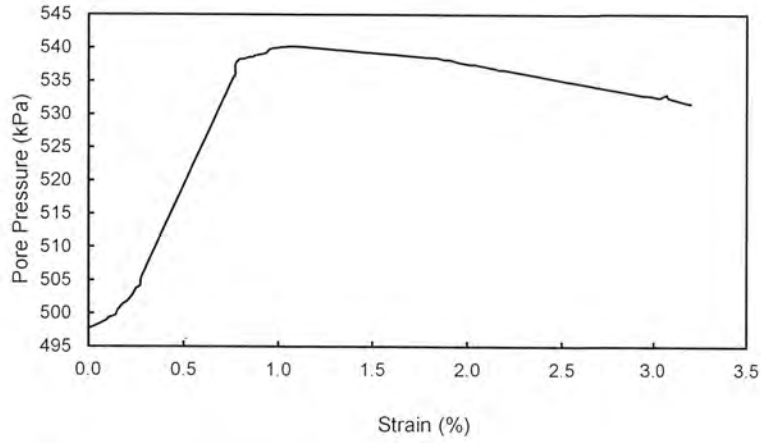
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
	Engineer	-	Sample	U5
			Depth (m)	1.50
			Sample Type	U


STAGE 3




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		

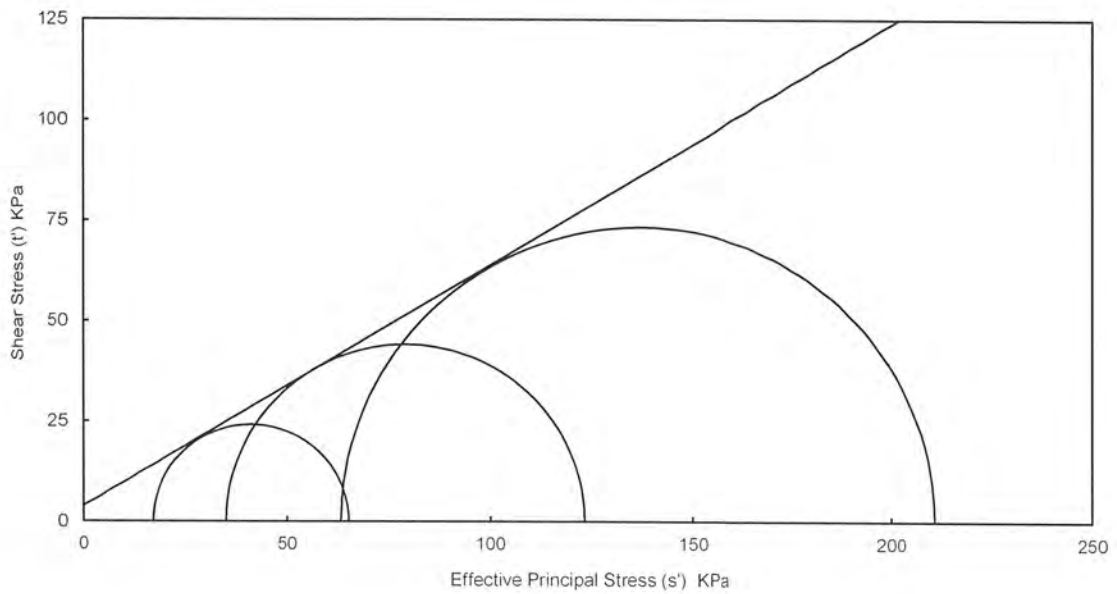
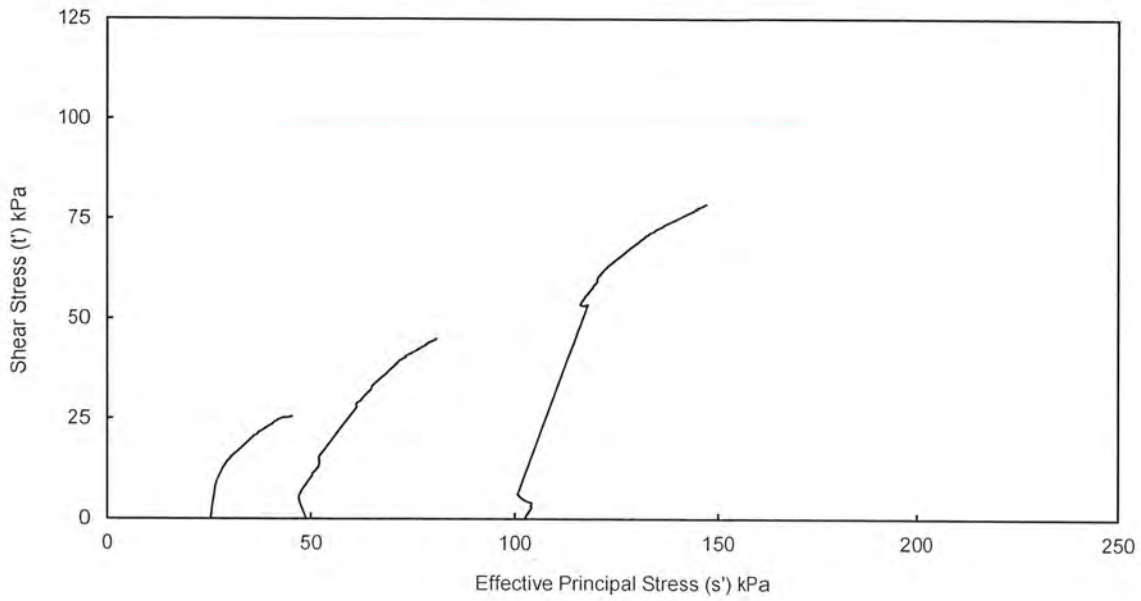
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
	Engineer	-	Sample	U5
			Depth (m)	1.50
			Sample Type	U


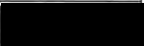


Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		




 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID      BH SBC024 Sample        U5 Depth (m)    1.50 Sample Type   U
	Engineer      -	



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	 07/07/2021		


<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC024
	Engineer	-	Sample	U5
			Depth (m)	1.50
			Sample Type	U



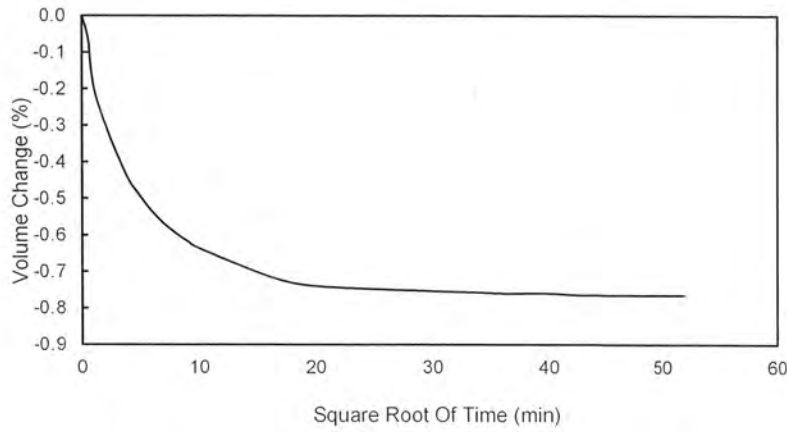
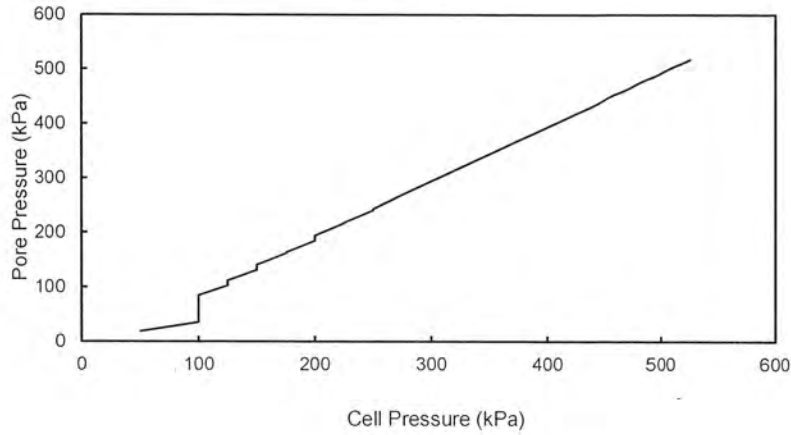
Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	07/07/2021		







 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID BH SBC027 Sample U12 Depth (m) 2.00 Sample Type U
	Engineer -	

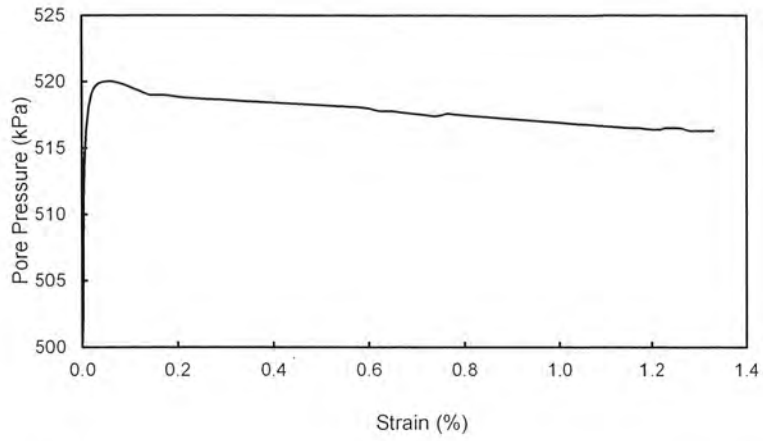
STAGE 1



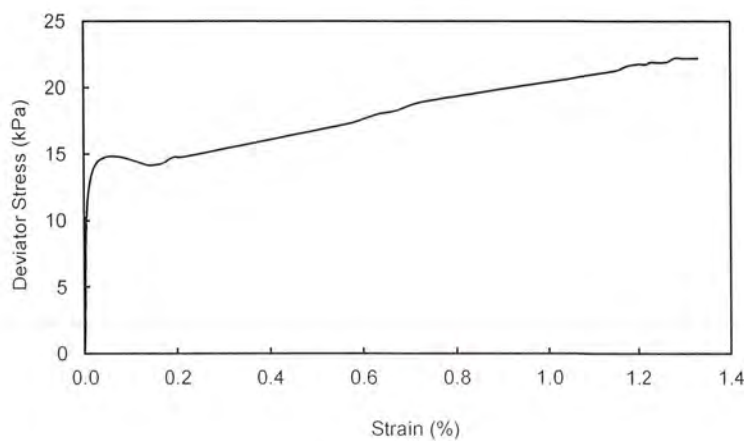
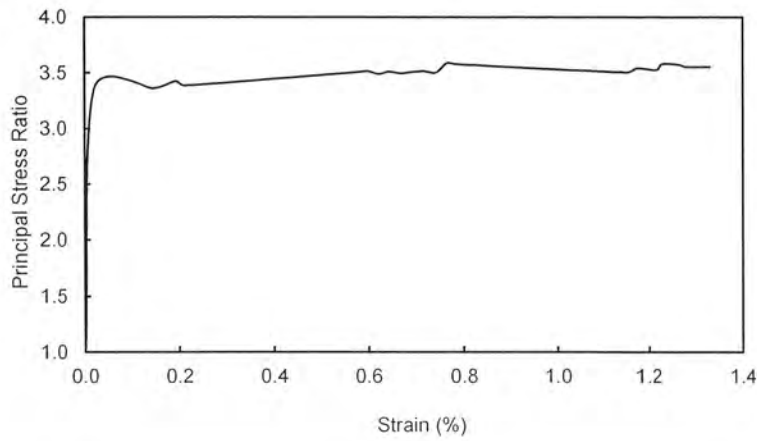
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MDB	15/07/2021		





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Type	U



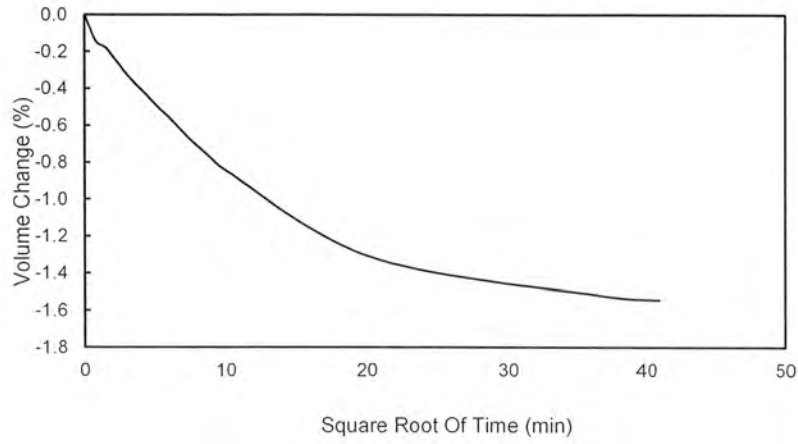
STAGE 1




Originator	C- A- [REDACTED]	CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		


	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Type	U

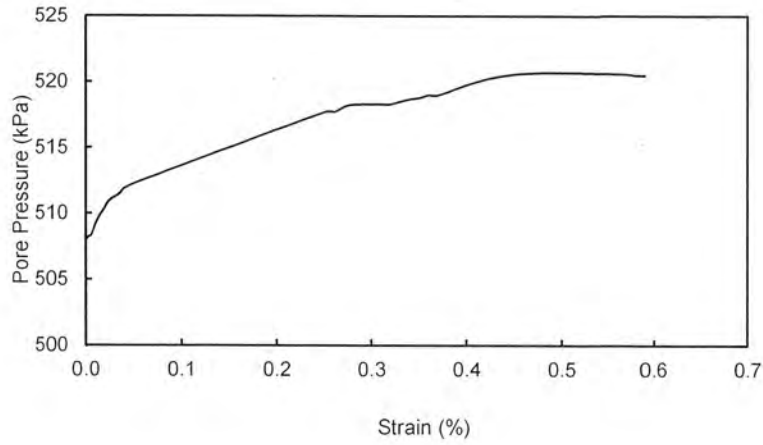
STAGE 2



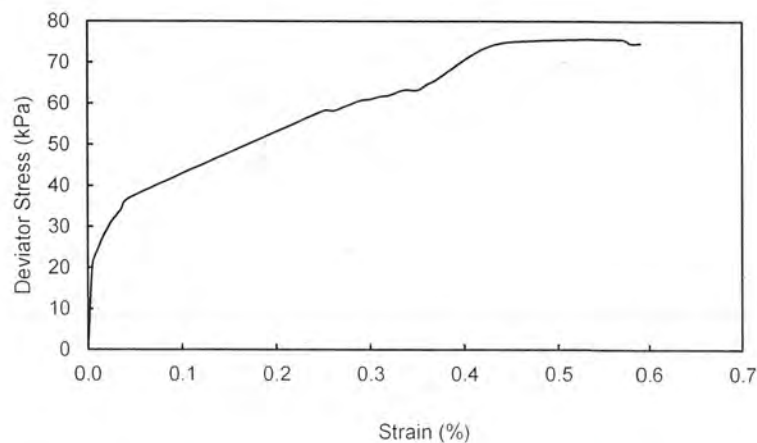
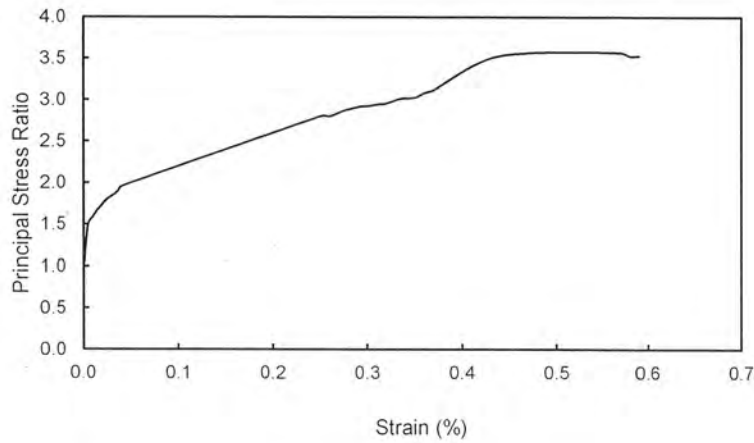
Originator	[REDACTED]	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		





 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Tyoe	U



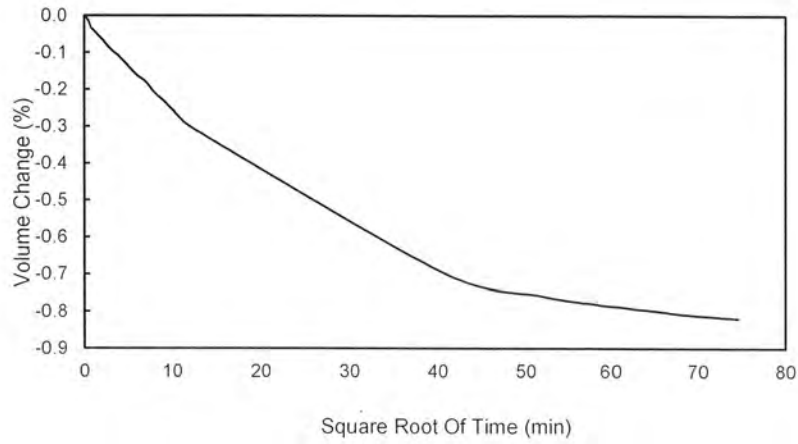
STAGE 2




Originator	[REDACTED]	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		


	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Tyoe	U

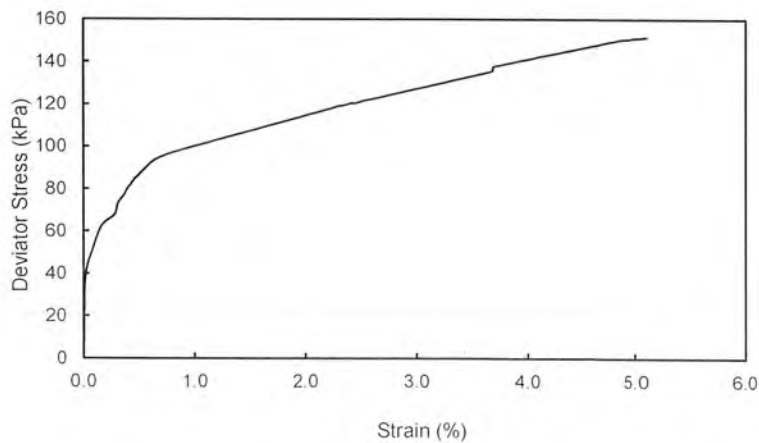
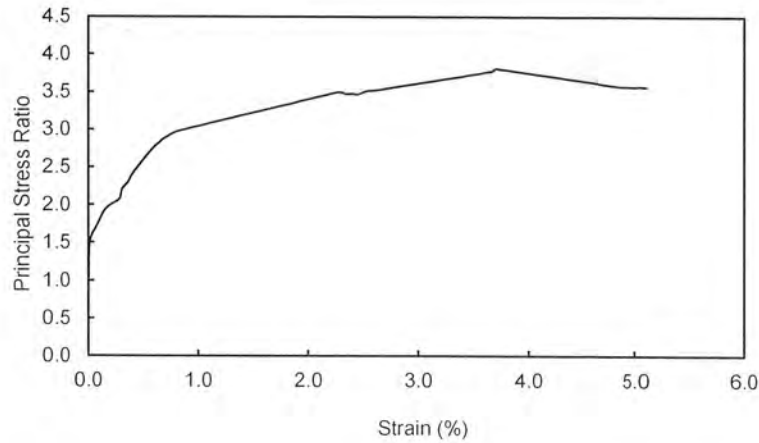
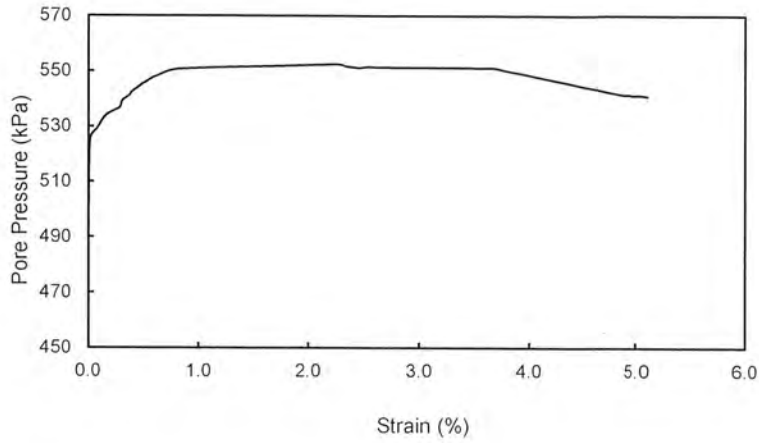
STAGE 3





Originator	[Redacted]	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		
			Sheet 6 of 8

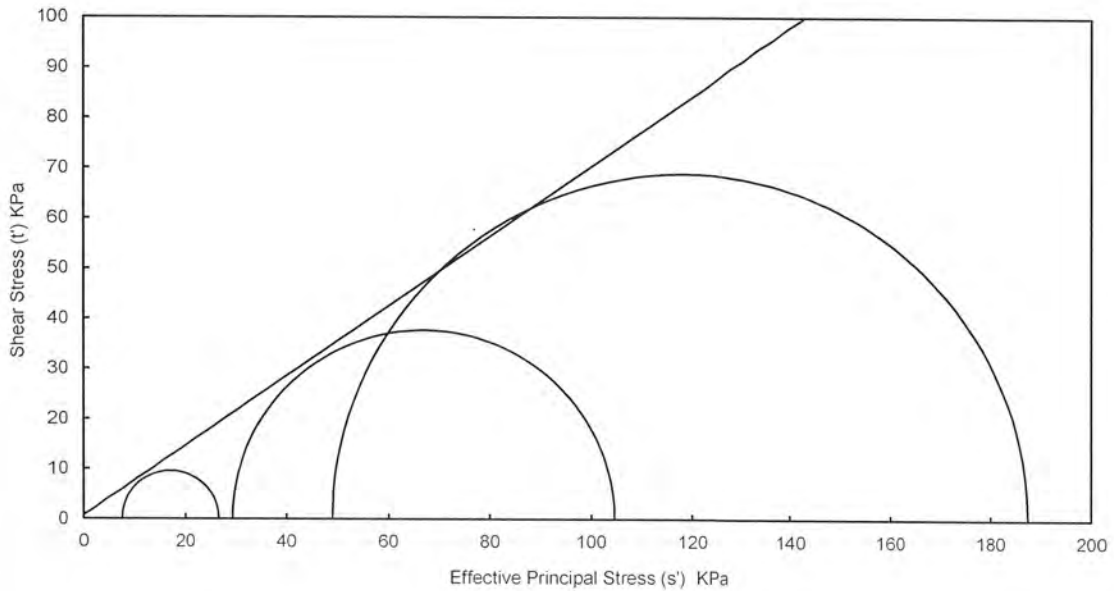
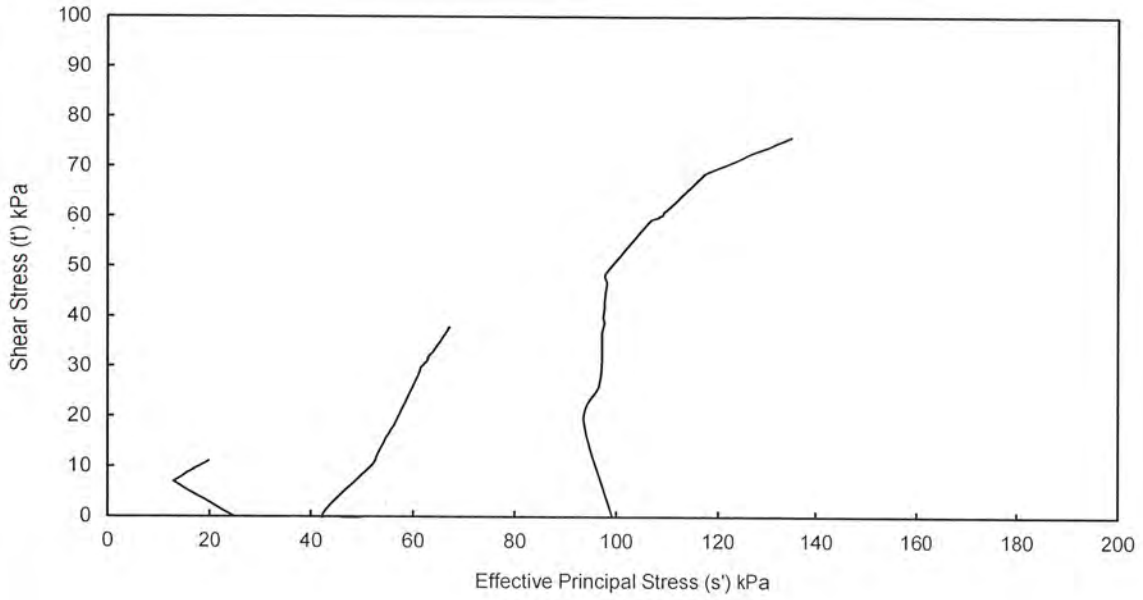




 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Type	U



Originator	[REDACTED]	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	15/07/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Type	U





Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	 15/07/2021		



<b>TERRA TEK</b> SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC027
	Engineer	-	Sample	U12
			Depth (m)	2.00
			Sample Tyoe	U



Originator	[REDACTED]	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	15/07/2021		

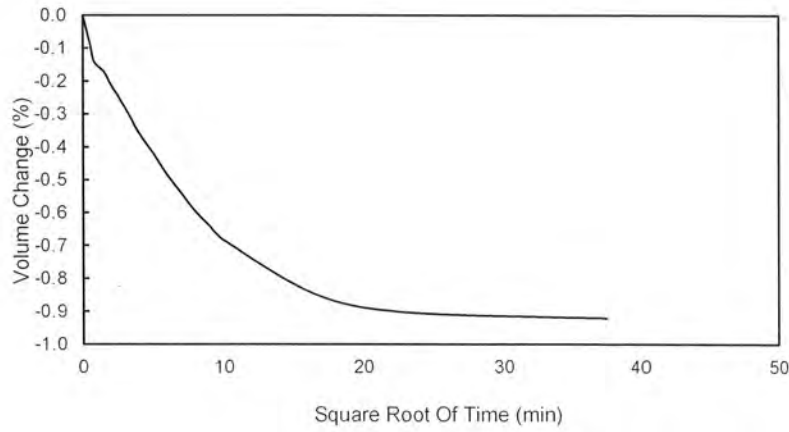
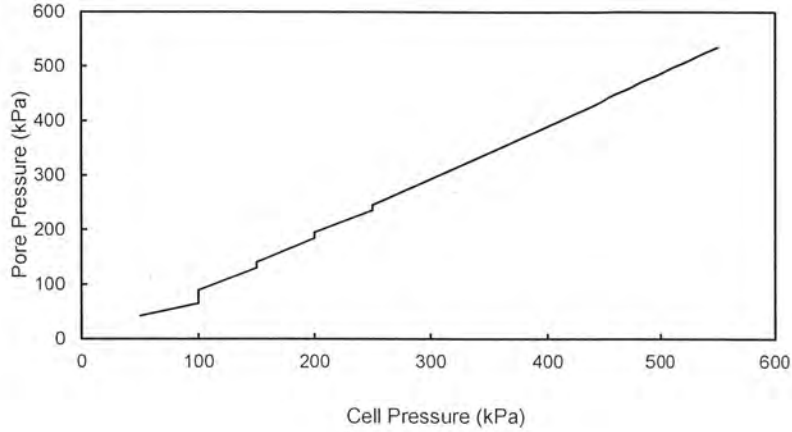
		Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9		Contract No.	4322A
		Client	Allied Exploration & Geotechnical Limited		Hole ID	BH SBC028
		Engineer	-		Sample	U18
				Depth (m)	5.50	
				Sample Type	U	
Description			Firm intact dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse.			
<b>INITIAL CONDITIONS</b>						
Depth Within Original Sample	m		5.55-5.75			
Orientation Within Original Sample			Vertical			
Specimen Preparation			Undisturbed			
Hand Vane Top	kPa		189			
Hand Vane Bottom	kPa		287			
Diameter	mm		102.1			
Height	mm		202.0			
Moisture Content	%		12			
Bulk Density	Mg/m <sup>3</sup>		2.22			
Drainage Conditions			One end and radial boundary with side drains			
<b>SATURATION</b>						
Final Cell Pressure	kPa		550			
Final Pore Pressure	kPa		535			
Final Pore Pressure Parameter B			0.97			
Duration	day		5			
<b>CONSOLIDATION</b>			Stage No.	1	2	3
Final Cell Pressure	kPa		550	600	700	
Back Pressure	kPa		500	500	500	
Effective Pressure	kPa		50	100	200	
Final Pore Pressure	kPa		493	498	495	
Final Pore Pressure Dissipation	%		100	100	100	
Duration	day		1	2	3	
<b>COMPRESSION</b>						
Cell Pressure	kPa		550	600	700	
Initial Pore Pressure	kPa		493	498	495	
Rate of Axial Displacement	mm/min		0.0024	0.0019	0.0016	
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>						
Pore Pressure	kPa		516	533	585	
Minor Effective Principal Stress	kPa		34	67	115	
Deviator Stress	kPa		79	145	229	
Major Effective Principal Stress	kPa		113	213	344	
Effective Principal Stress Ratio			3.3	3.2	3.0	
Axial Strain	%		3.3	2.1	1.1	
Corrections Applied to Deviator Stress	kPa		0.5	0.3	0.2	
Duration	day		2	3	3	
<b>EFFECTIVE STRESS PARAMETERS</b>						
Cohesion c'	kPa		6			
Angle of Shearing Resistance $\phi'$	degree		28.5			
<b>FINAL CONDITIONS</b>						
Moisture Content	%		12			
Bulk Density	Mg/m <sup>3</sup>		2.28			
Failure Mode			See Photograph			
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120				
MDB	19/06/2021					
						Sheet 1 of 8





Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
Engineer	-	Sample	U18
		Depth (m)	5.50
		Sample Type	U

STAGE 1



Originator	Checked & Approved	<p><b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b></p> <p>BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120</p>	
MDB	19/05/2021		

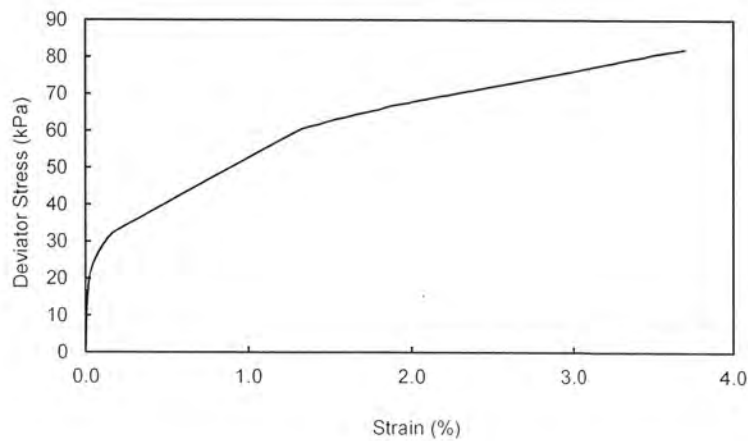
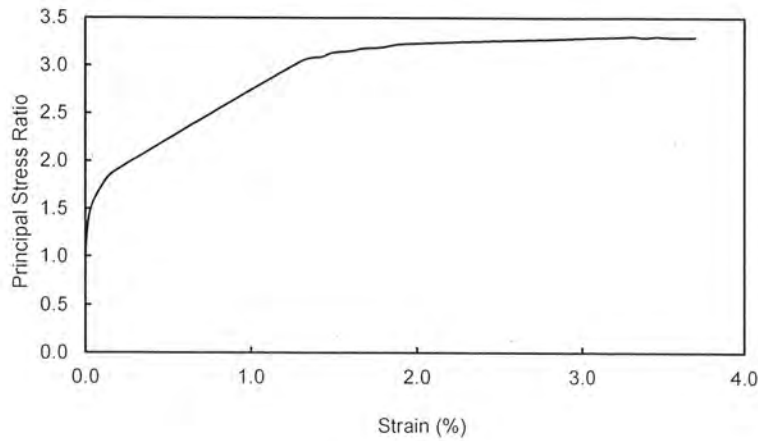
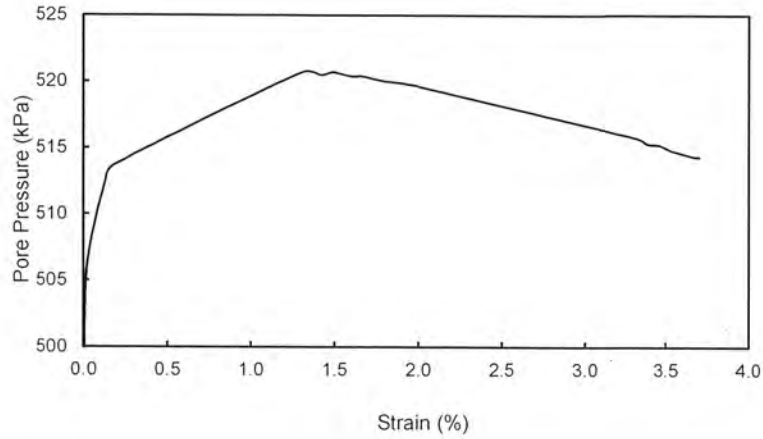


SITE INVESTIGATION AND LABORATORY SERVICES

Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9
Client	Allied Exploration & Geotechnical Limited
Engineer	-

Contract No.	4322A
Hole ID	BH SBC028
Sample	U18
Depth (m)	5.50
Sample Type	U

STAGE 1

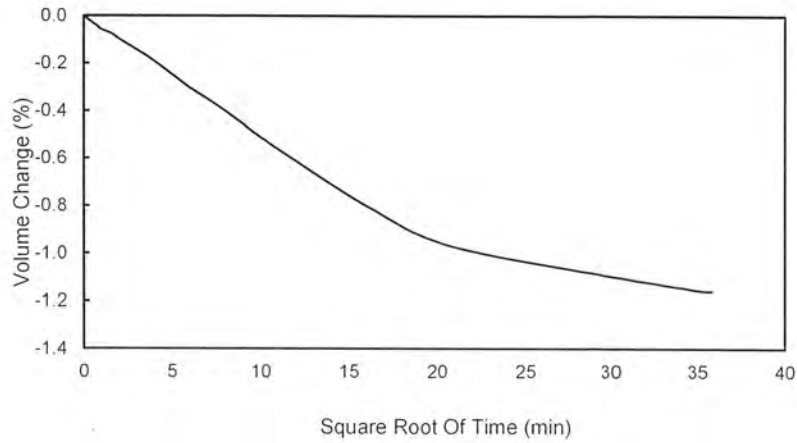


Originator	Checked & Approved	<p><b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b></p> <p>BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120</p>	
MDB	19/06/2021		




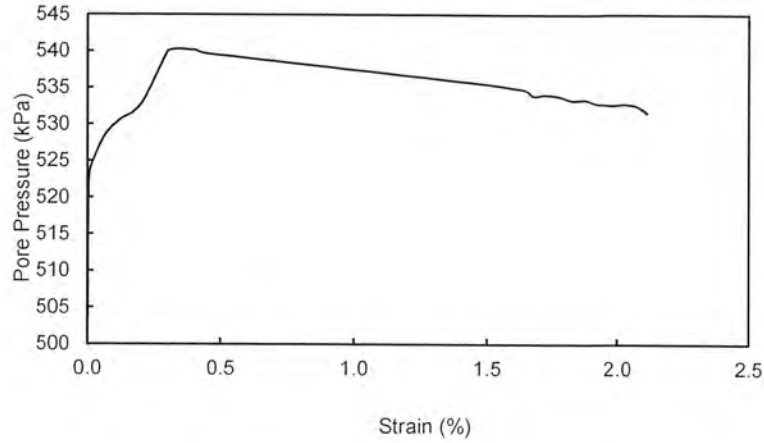
<b>TERRA TEK</b> SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U

STAGE 2

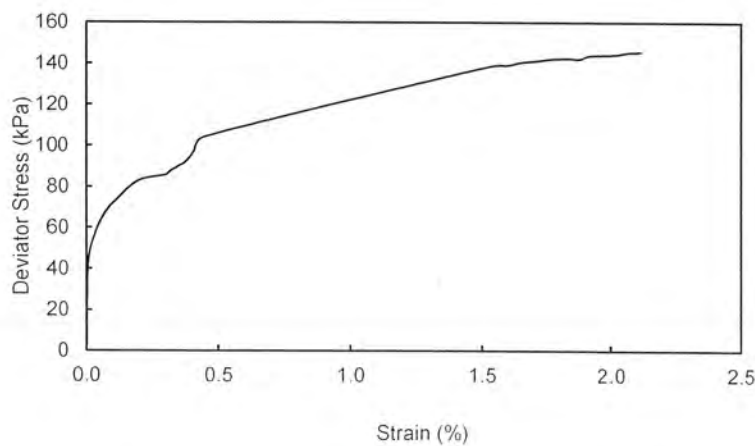
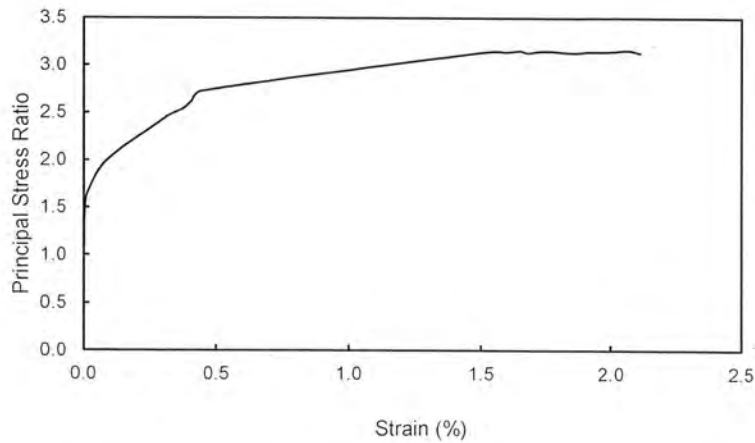



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U




STAGE 2

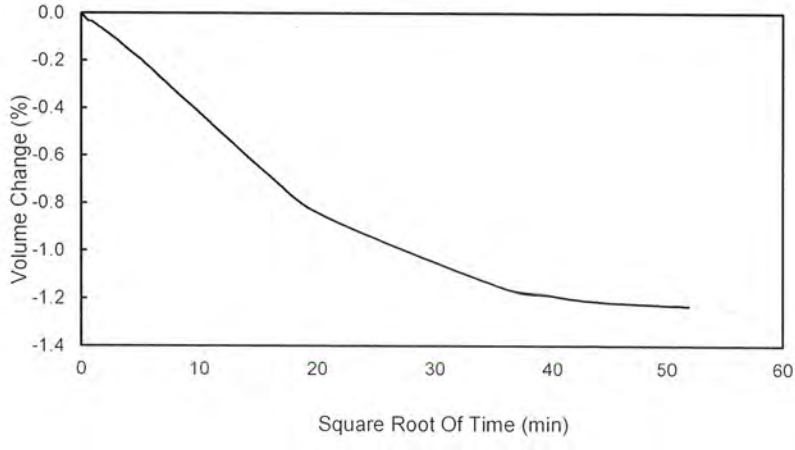



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		




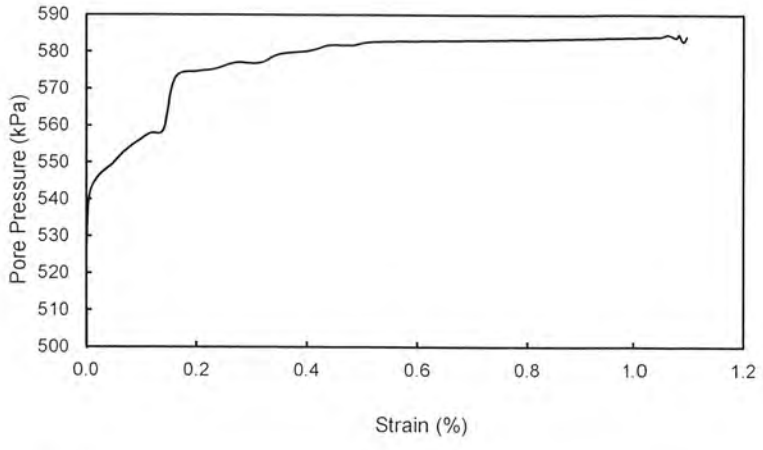
 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U

STAGE 3

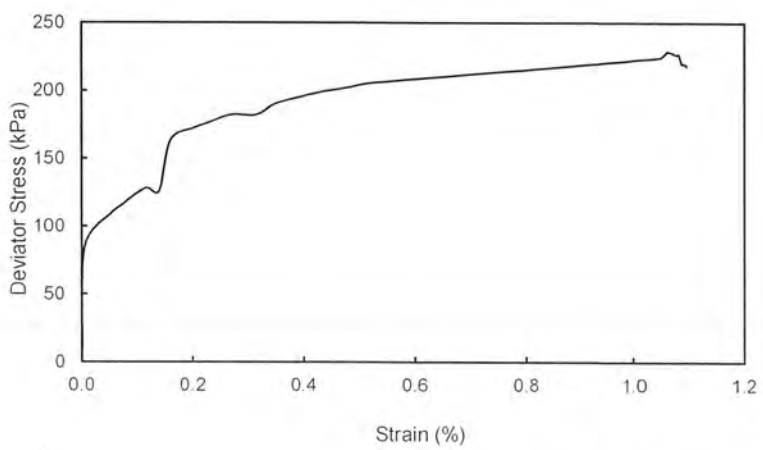
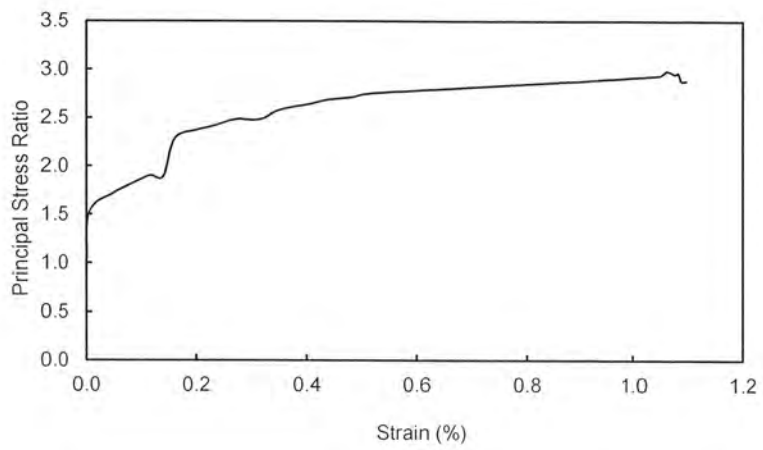



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		

 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U




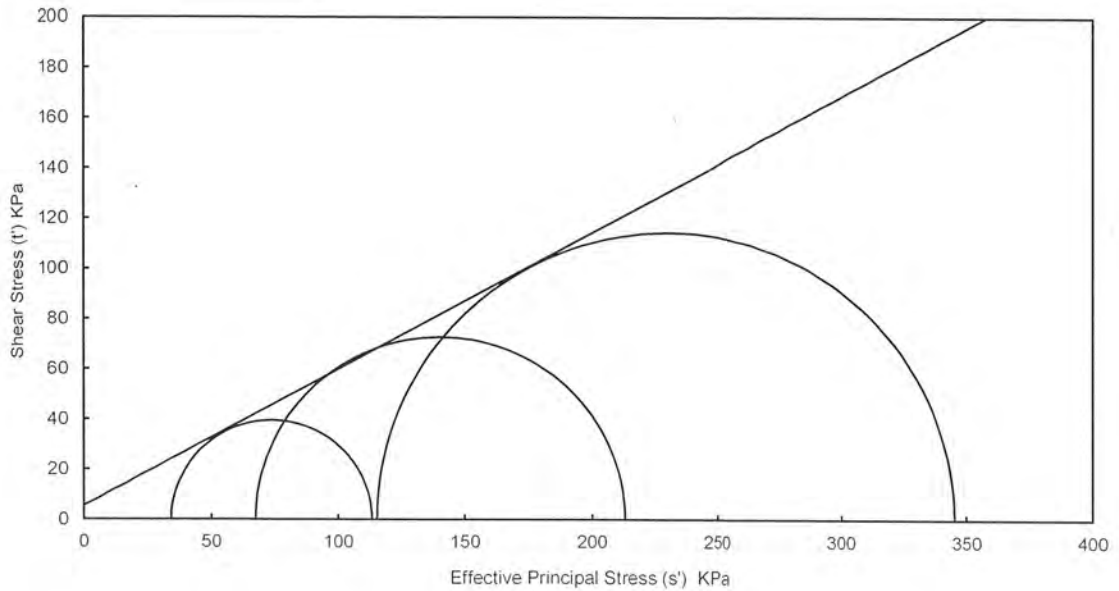
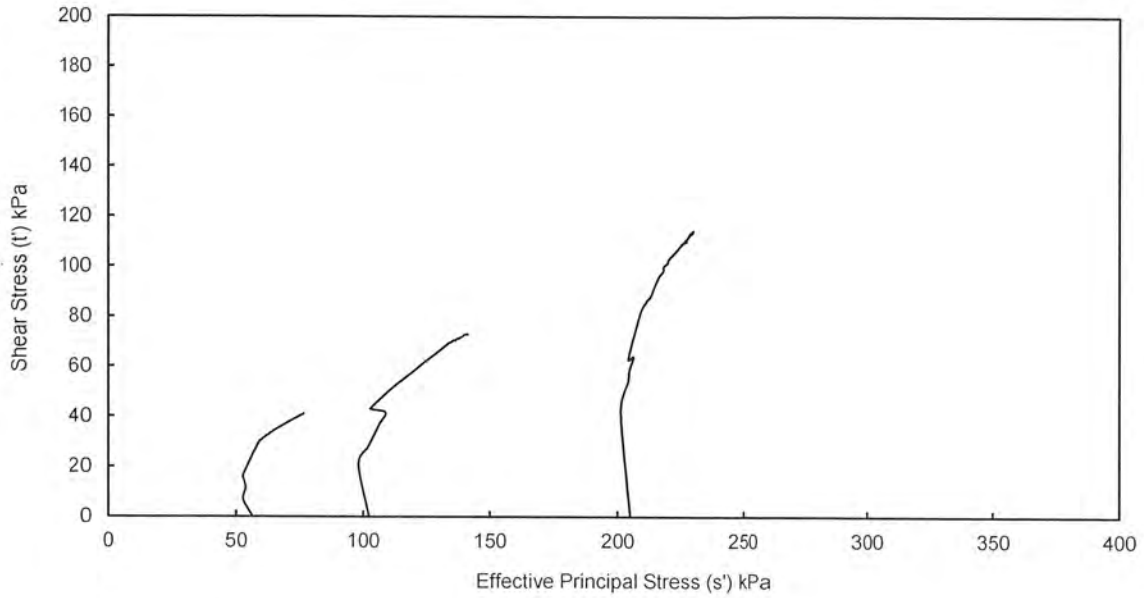
STAGE 3




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		

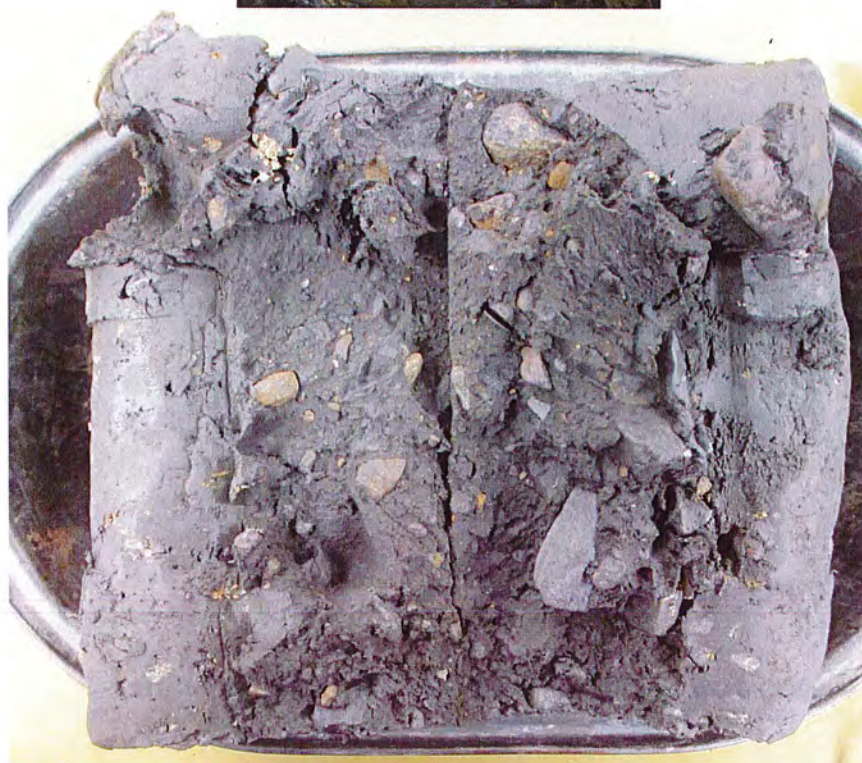


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U





Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	19/06/2021		

<b>TERRA TEK</b> <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC028
	Engineer	-	Sample	U18
			Depth (m)	5.50
			Sample Type	U



Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	[Redacted] 19/06/2021		

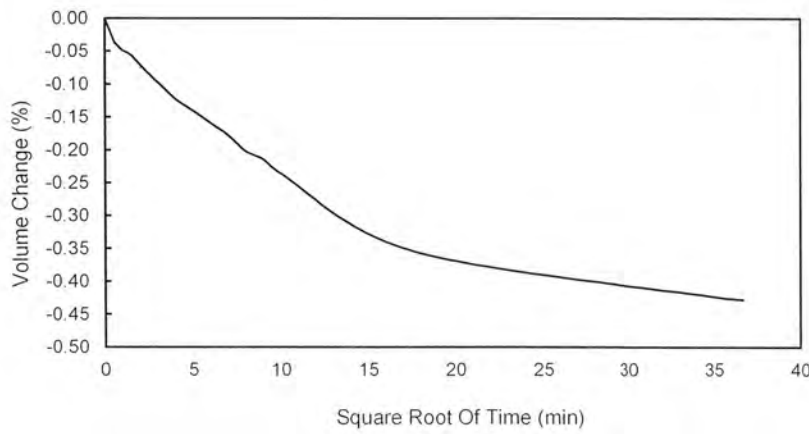
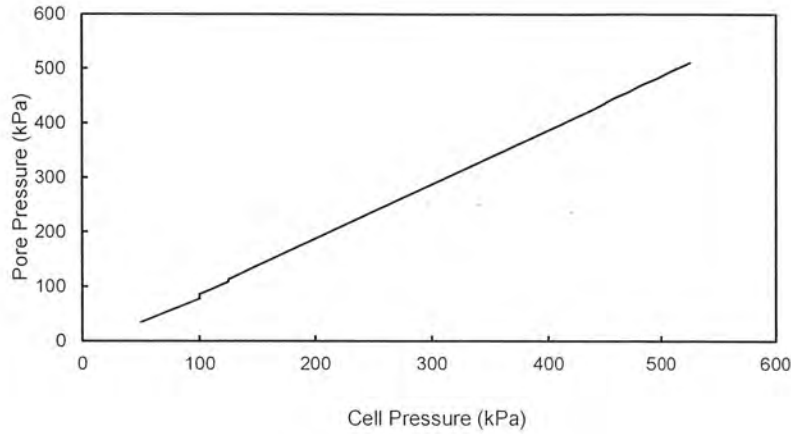


 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9			Contract No.	4322A		
	Client	Allied Exploration & Geotechnical Limited			Hole ID	BH SBC031		
	Engineer	-			Sample	U14		
					Depth (m)	4.00		
					Sample Type	U		
Description		Firm fissured dark brown slightly sandy slightly gravelly SILT/CLAY.						
<b>INITIAL CONDITIONS</b>								
Depth Within Original Sample	m	4.05-4.25						
Orientation Within Original Sample		Vertical						
Specimen Preparation		Undisturbed						
Hand Vane Top	kPa	147						
Hand Vane Bottom	kPa	120						
Diameter	mm	102.0						
Height	mm	200.6						
Moisture Content	%	20						
Bulk Density	Mg/m <sup>3</sup>	2.07						
Drainage Conditions		One end and radial boundary with side drains						
<b>SATURATION</b>								
Final Cell Pressure	kPa	525						
Final Pore Pressure	kPa	511						
Final Pore Pressure Parameter B		0.99						
Duration	day	3						
<b>CONSOLIDATION</b>		Stage No.	1	2	3			
Final Cell Pressure	kPa	525	550	600				
Back Pressure	kPa	500	500	500				
Effective Pressure	kPa	25	50	100				
Final Pore Pressure	kPa	500	500	499				
Final Pore Pressure Dissipation	%	100	100	100				
Duration	day	1	2	3				
<b>COMPRESSION</b>								
Cell Pressure	kPa	525	550	600				
Initial Pore Pressure	kPa	500	500	499				
Rate of Axial Displacement	mm/min	0.00200	0.00081	0.00244				
<b>FAILURE CONDITIONS AT MAXIMUM PRINCIPAL STRESS RATIO</b>								
Pore Pressure	kPa	506	510	525				
Minor Effective Principal Stress	kPa	19	40	75				
Deviator Stress	kPa	51	103	178				
Major Effective Principal Stress	kPa	70	143	253				
Effective Principal Stress Ratio		3.8	3.6	3.4				
Axial Strain	%	1.3	3.3	3.3				
Corrections Applied to Deviator Stress	kPa	0.2	0.5	0.7				
Duration	day	2	6	3				
<b>EFFECTIVE STRESS PARAMETERS</b>								
Cohesion c'	kPa	4						
Angle of Shearing Resistance Ø'	degree	31.4						
<b>FINAL CONDITIONS</b>								
Moisture Content	%	19						
Bulk Density	Mg/m <sup>3</sup>	2.11						
Failure Mode		See Photograph						
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120						
MDB	07/07/2021							



Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
Engineer	-	Sample	U14
		Depth (m)	4.00
		Sample Type	U

STAGE 1



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> PS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120
MDB	[Redacted]	
	07/07/2021	

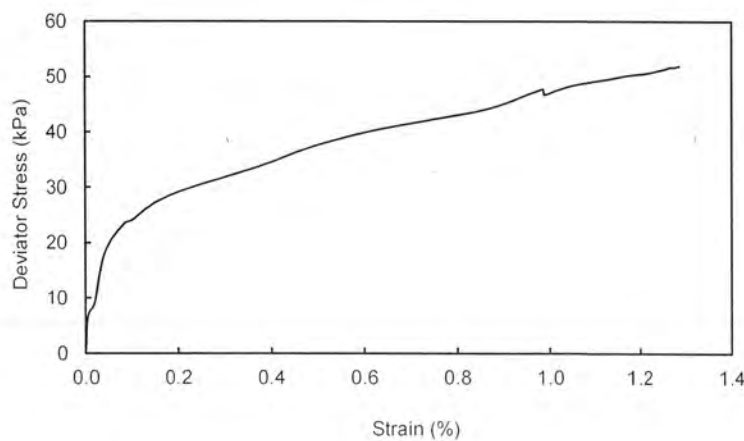
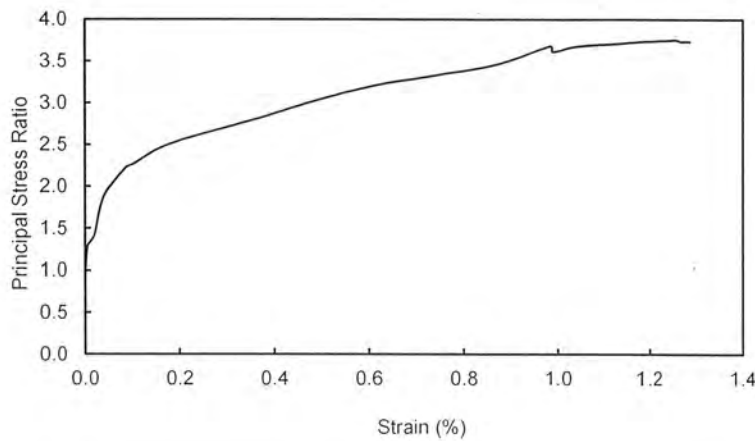
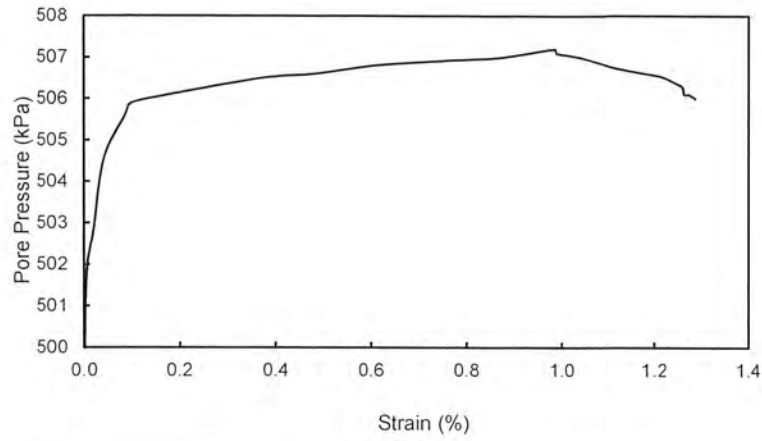







Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
Engineer	-	Sample	U14
		Depth (m)	4.00
		Sample Type	U

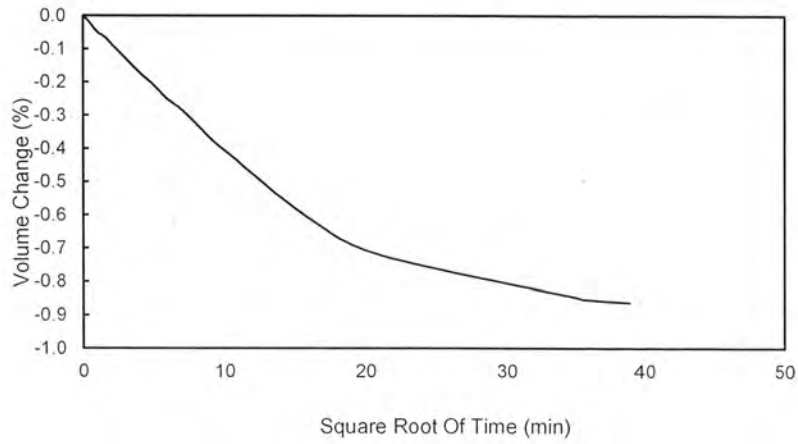
STAGE 1




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	[REDACTED]		
	07/07/2021		Sheet 3 of 8


 SITE INVESTIGATION AND LABORATORY SERVICES	Site A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No. <b>4322A</b>
	Client Allied Exploration & Geotechnical Limited	Hole ID      BH SBC031 Sample        U14 Depth (m)    4.00 Sample Type U
	Engineer     -	

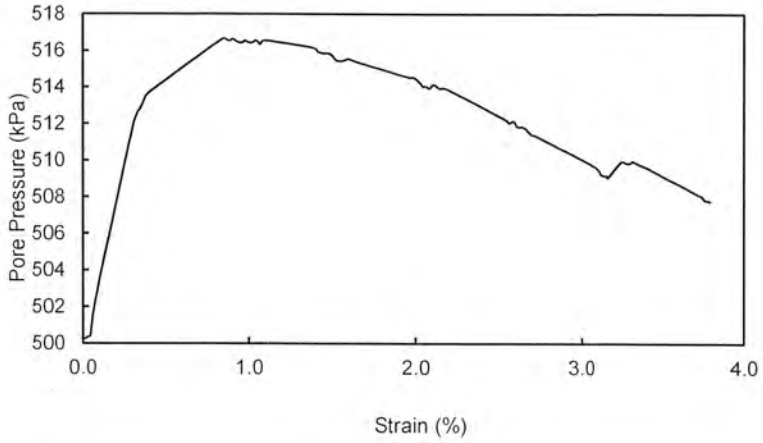
STAGE 2



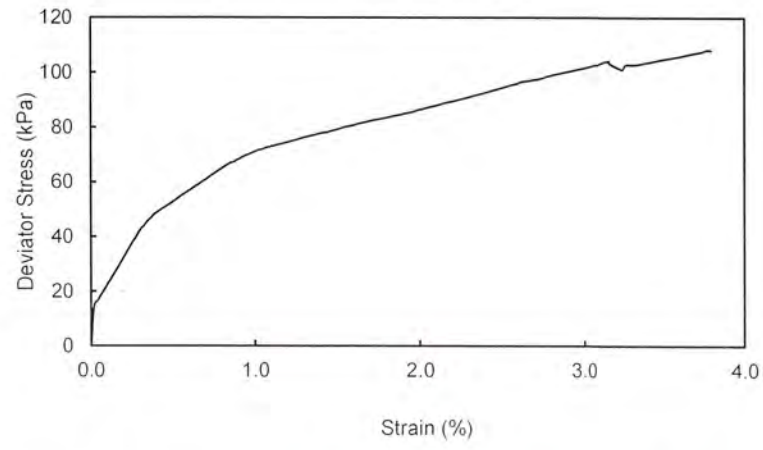
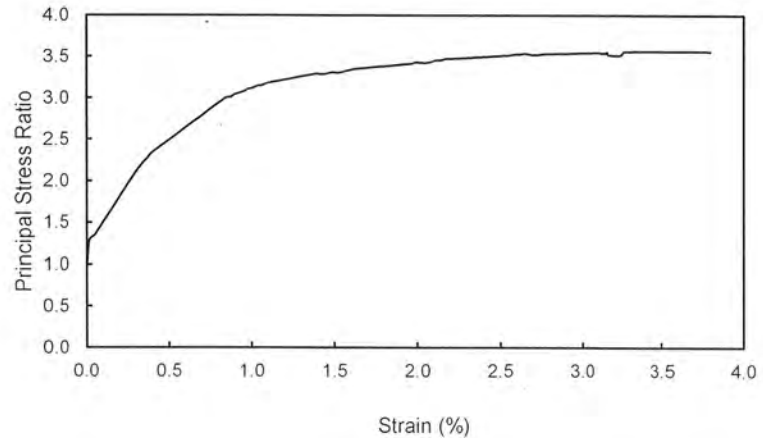
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
	Engineer	-	Sample	U14
			Depth (m)	4.00
			Sample Type	U




STAGE 2

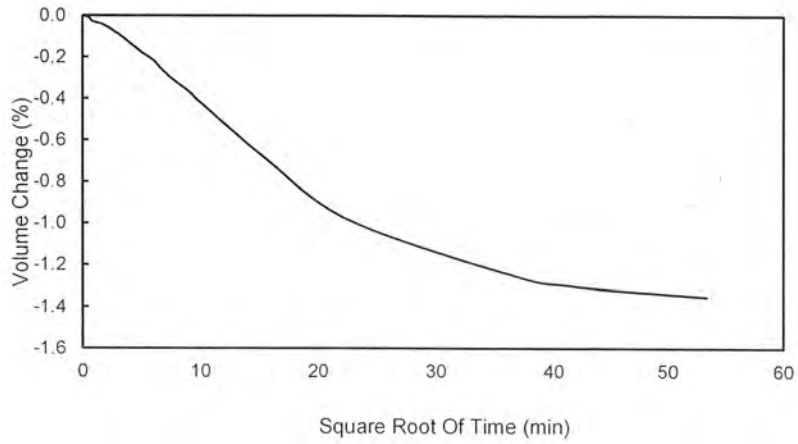



Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120
MDB	07/07/2021	



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	4322A
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
	Engineer	-	Sample	U14
			Depth (m)	4.00
			Sample Type	U

STAGE 3



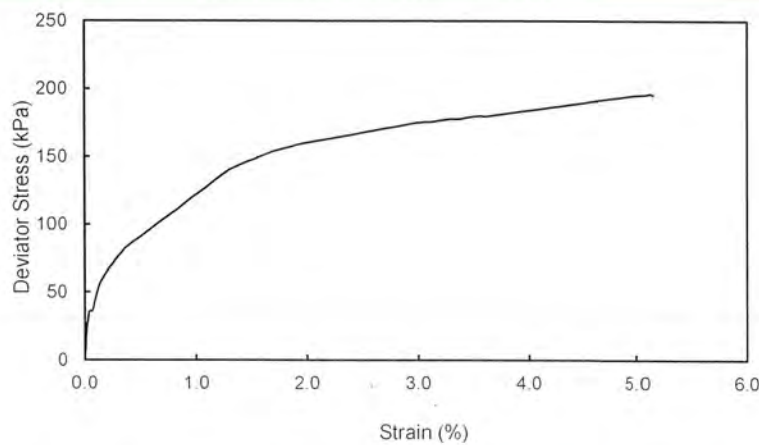
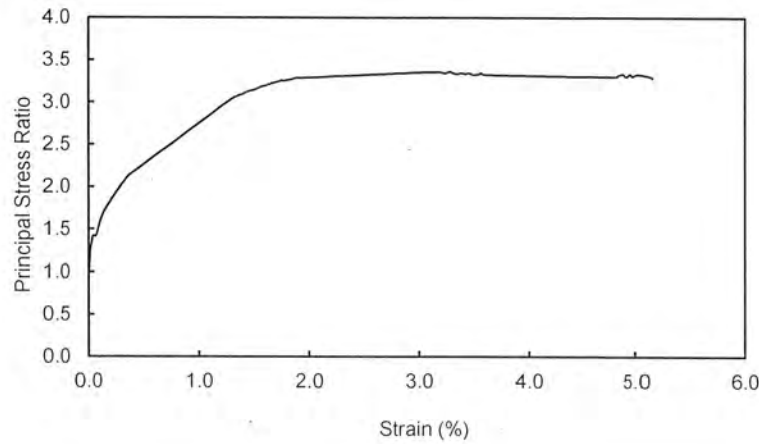
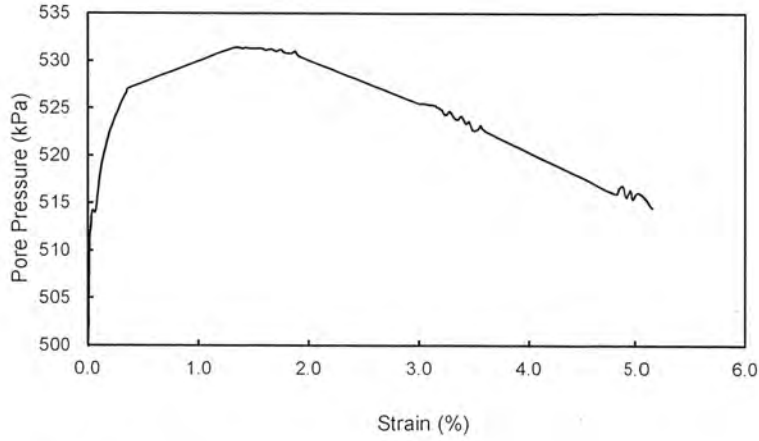
Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		






Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
Engineer	-	Sample	U14
		Depth (m)	4.00
		Sample Type	U

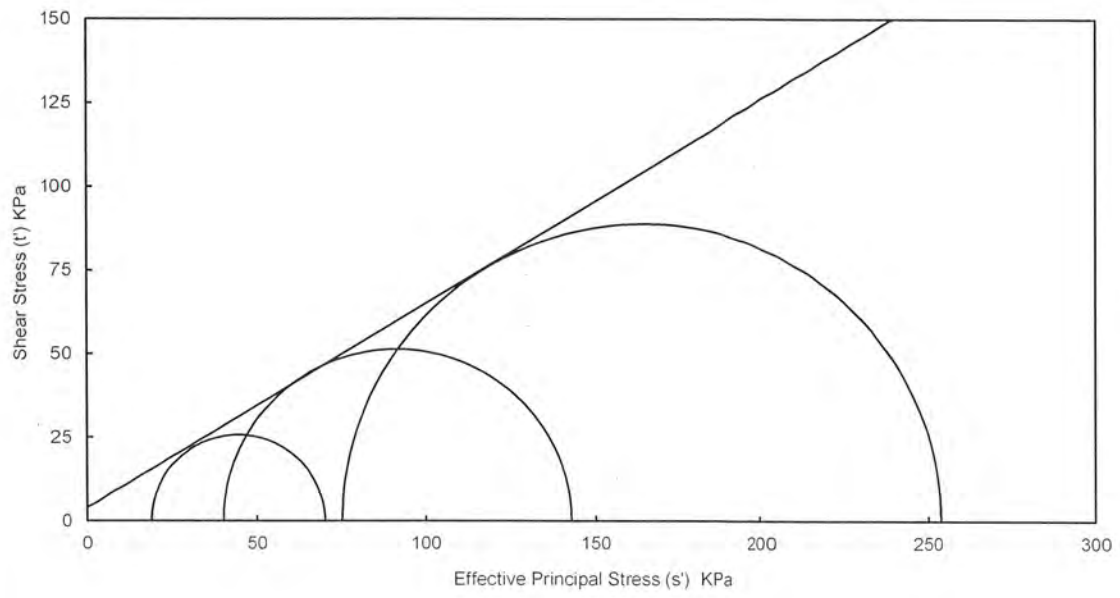
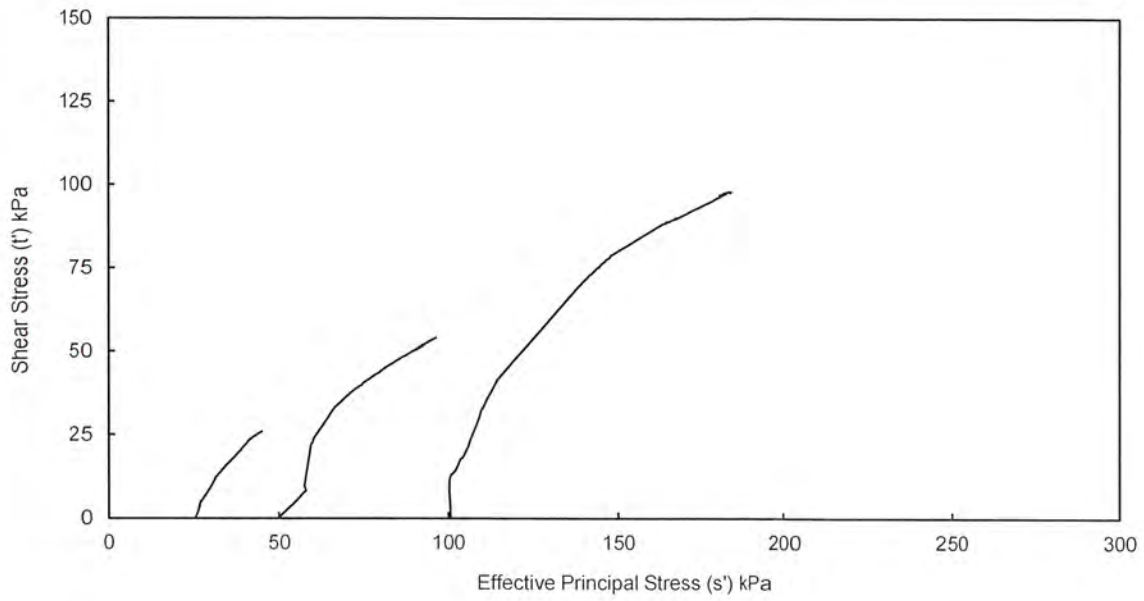
STAGE 3




Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8: Clauses 3 to 7:1990 and In-house Procedure TP120
MDB	07/07/2021	




	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
	Engineer	-	Sample	U14
			Depth (m)	4.00
			Sample Type	U





Originator	Checked & Approved	<b>CONSOLIDATED UNDRAINED MULTISTAGE TRIAXIAL TEST WITH PORE PRESSURE MEASUREMENT</b> BS1377:Part 8:Clauses 3 to 7:1990 and In-house Procedure TP120	
MDB	07/07/2021		



 <p><b>TERRA TEK</b>                  SITE INVESTIGATION AND LABORATORY SERVICES</p>	Site	A66 NORTH TRANS PENNINE SCHEME C SECTION 9	Contract No.	<b>4322A</b>
	Client	Allied Exploration & Geotechnical Limited	Hole ID	BH SBC031
	Engineer	-	Sample	U14
			Depth (m)	4.00
			Sample Type	U



Originator	Checked & Approved	Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the material.	
MDB	 07/07/2021		

# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,  
Pelton Fell, Chester le Street, DH2 2RG.

CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE

B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4322A      CLIENT : AMEY OW Limited

PROJECT : A66 North Trans Pennine Sceme C Section 9

HOLE : BH-SBC031

SAMPLE No : U25

DEPTH (m) : 9.50

### TEST SPECIMEN PREPARATION

: Undisturbed  
Specific Depth (m) : 9.73  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

### TEST SPECIMEN DETAILS

	Stage No	1	2	3
Length	mm	200.3		
Diameter	mm	102.7		
Moisture Content	%	11.4		
Bulk Density	Mg/m <sup>3</sup>	2.24		

### SATURATION STAGE

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 350  
Final Pore Pressure kPa 337.40  
Final Pore Pressure Parameter B 0.928  
Duration day(s) 2

### CONSOLIDATION STAGE

	kPa	350	400	500
Cell Pressure	kPa	350	400	500
Back Pressure	kPa	300	300	300
Effective Pressure	kPa	50	100	200
Final Pore Pressure	kPa	298.9	300.8	300.1
Duration	day(s)	2	2	3

### SHEARING STAGE

	kPa	350	400	500
Cell Pressure	kPa	350	400	500
Rate of Axial Displacement	mm/min	0.00415	0.00414	0.00522
Final Moisture Content	%	11.7		
Final Bulk Density	Mg/m <sup>3</sup>	2.25		

### CONDITIONS AT FAILURE

	Criterion	Maximum stress ratio		
Pore Pressure	kPa	319	332	364
Minor Effective Principal Stress	kPa	32	68	136
Deviator Stress	kPa	74	141	256
Major Effective Principal Stress	kPa	105	210	392
Effective Principal Stress Ratio		3.33	3.06	2.88
Pore Pressure Parameter A		0.27	0.22	0.25
Axial Strain	%	3.0	5.3	8.1
Correction applied to Principal Stress	kPa	2.6	4.4	4.9
Duration	Days	1	1	4

Apparent Cohesion c' 8

Angle of Shearing Resistance degrees 27.5

Sheet 1 of 4



PROJECT No : 4322A      CLIENT : AMEY OW Limited

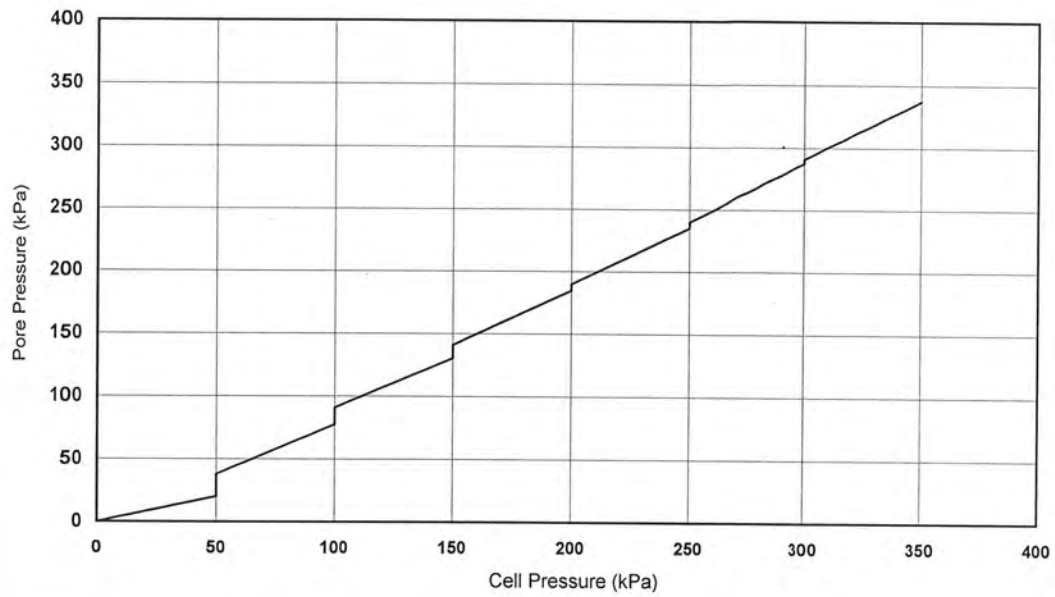
PROJECT : A66 North Trans Pennine Sceme C Section 9

HOLE : BH-SBC031

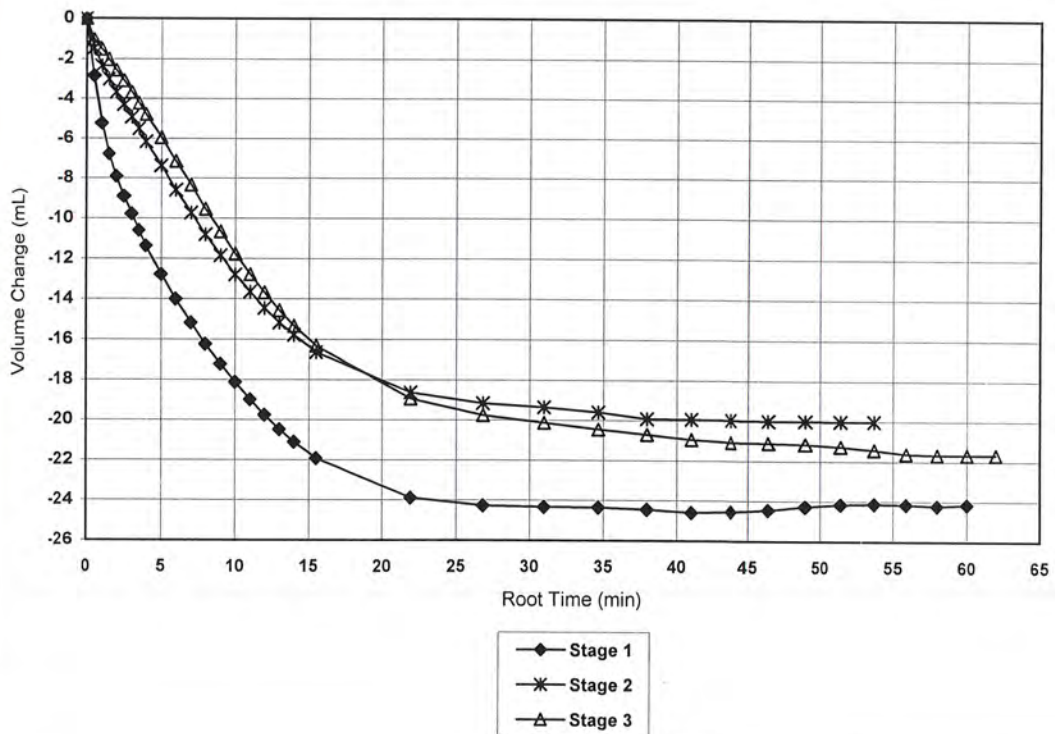
SAMPLE No : U25

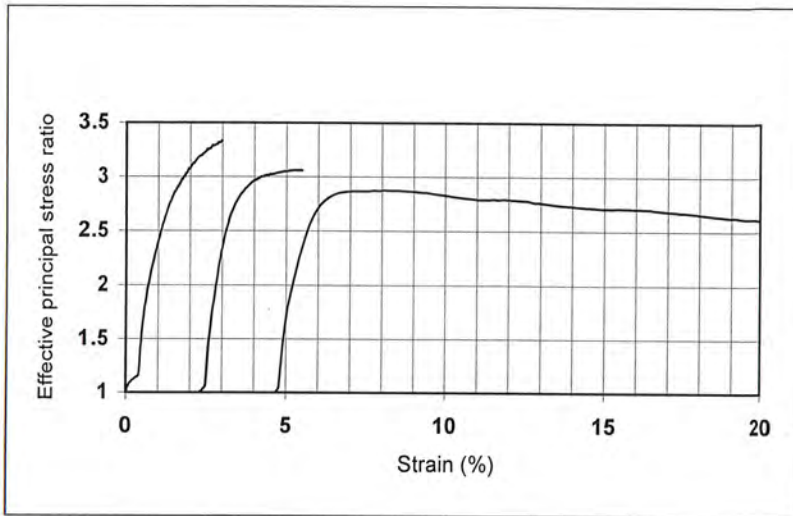
DEPTH (m) : 9.50

### SATURATION STAGE



### CONSOLIDATION STAGE



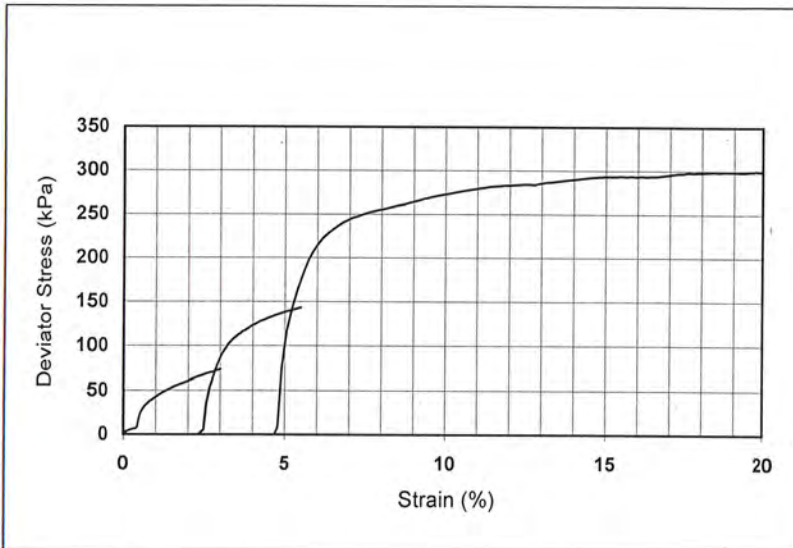


**Failure Conditions**

At maximum stress ratio

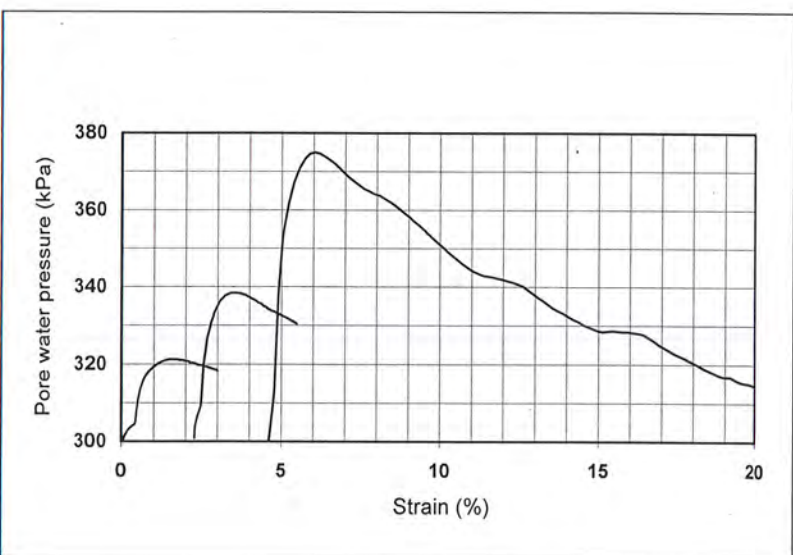
**Stage 1**

strain                    2.97 %  
 deviator stress        73.5 kPa  
 stress ratio            3.33



**Stage 2**

strain                    5.26 %  
 deviator stress        141.2 kPa  
 stress ratio            3.06



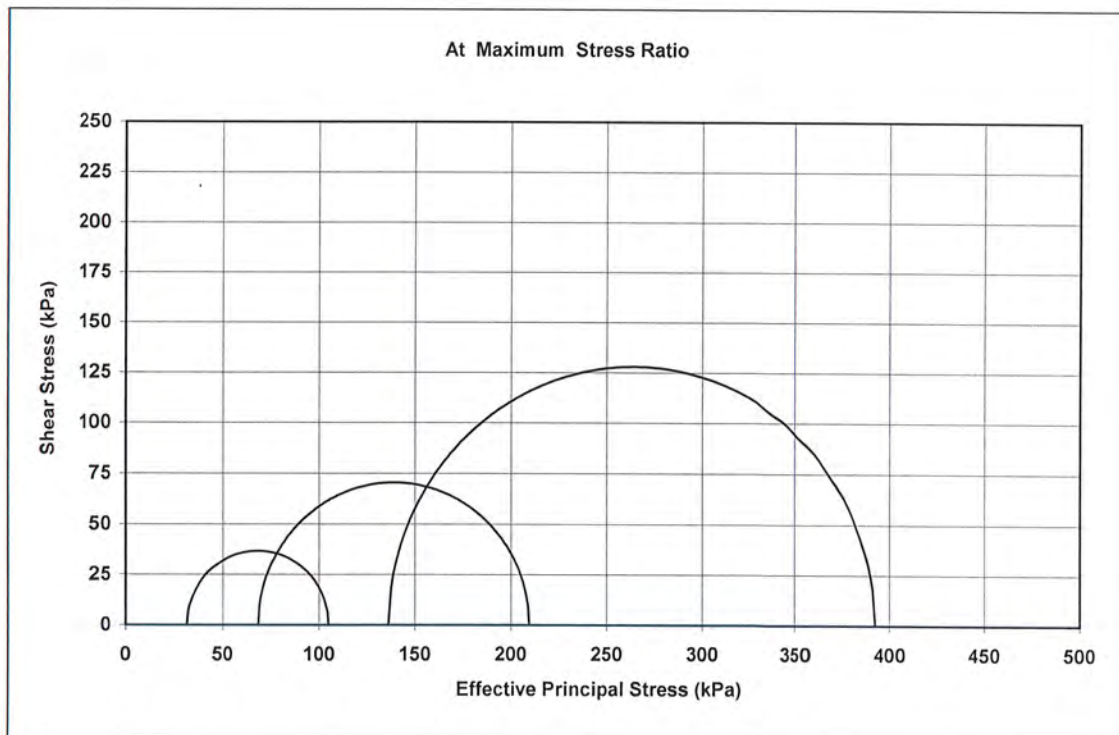
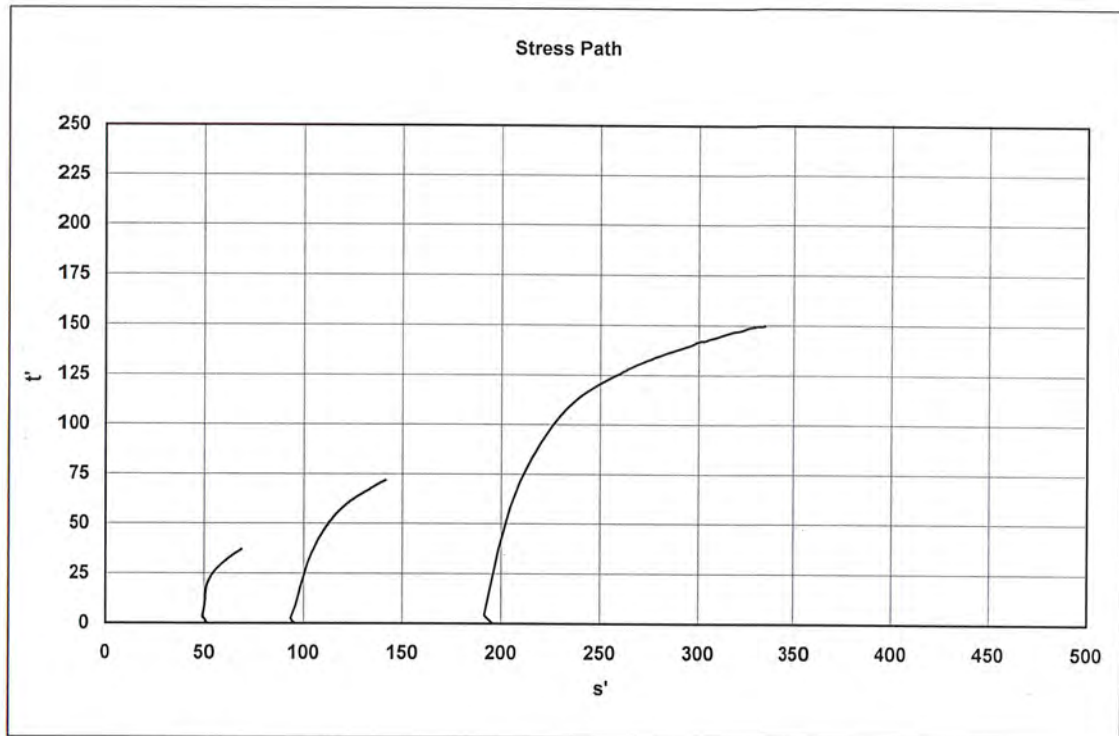
**Stage 3**

strain                    8.07 %  
 deviator stress        255.8 kPa  
 stress ratio            2.88



**FAILURE MODE**





# ALLIED EXPLORATION AND GEOTECHNICS LIMITED

Unit 25 Stella Gill Industrial Estate,  
Pelton Fell, Chester le Street, DH2 2RG.

CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF PORE WATER PRESSURE

B.S. 1377 : Part 8 : 1990 : Clauses 3,4,5,6 and 7

PROJECT No : 4322A      CLIENT : AMEY OW Limited

PROJECT : A66 North Trans Pennine Sceme C Section 9

HOLE : BH SBC032A

SAMPLE No : U3

DEPTH (m) : 5.00

**TEST SPECIMEN PREPARATION**

: Undisturbed  
Specific Depth (m) : 5.24  
Orientation within original sample : Vertical  
Description : Please refer to sample description sheet.

**TEST SPECIMEN DETAILS**

	Stage No	1	2	3
Length	mm	200.9		
Diameter	mm	102.5		
Moisture Content	%	10.5		
Bulk Density	Mg/m <sup>3</sup>	2.27		

**SATURATION STAGE**

Drainage Conditions : Both ends and radial boundary  
Final Cell Pressure kPa 350  
Final Pore Pressure kPa 334.8  
Final Pore Pressure Parameter B 0.9  
Duration day(s) 2

**CONSOLIDATION STAGE**

Cell Pressure	kPa	350	400	500
Back Pressure	kPa	300	300	300
Effective Pressure	kPa	50	100	200
Final Pore Pressure	kPa	302.2	300.5	300.8
Duration	day(s)	2	2	2

**SHEARING STAGE**

Cell Pressure	kPa	350	400	500
Rate of Axial Displacement	mm/min	0.0042	0.0042	0.0052
Final Moisture Content	%	10.6		
Final Bulk Density	Mg/m <sup>3</sup>	2.27		

**CONDITIONS AT FAILURE**

	Criterion	Maximum stress ratio		
Pore Pressure	kPa	326	337	373
Minor Effective Principal Stress	kPa	24	63	127
Deviator Stress	kPa	55	131	252
Major Effective Principal Stress	kPa	79	194	379
Effective Principal Stress Ratio		3.34	3.06	2.98
Pore Pressure Parameter A		0.44	0.28	0.29
Axial Strain	%	3.1	5.6	9.0
Correction applied to Principal Stress	kPa	2.42	4.5	5.0
Duration	Days	1	1	4

Apparent Cohesion

c' 4

Angle of Shearing Resistance

degrees 29

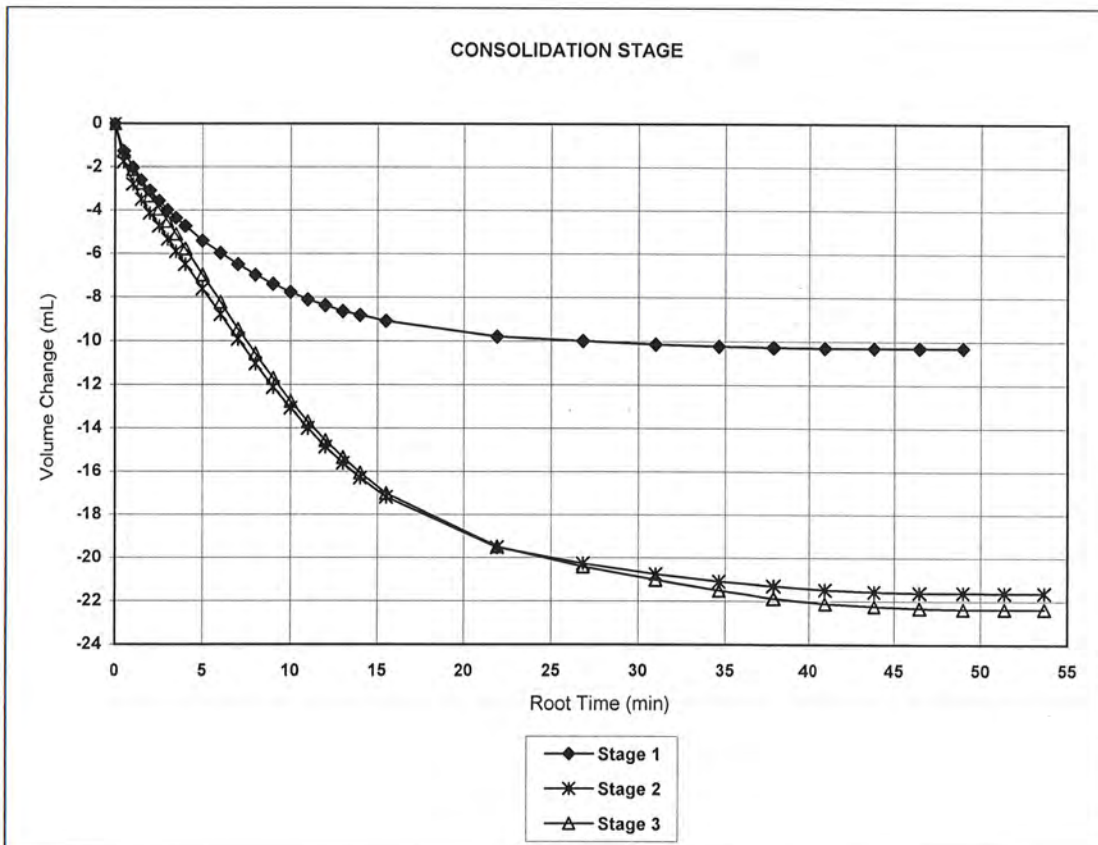
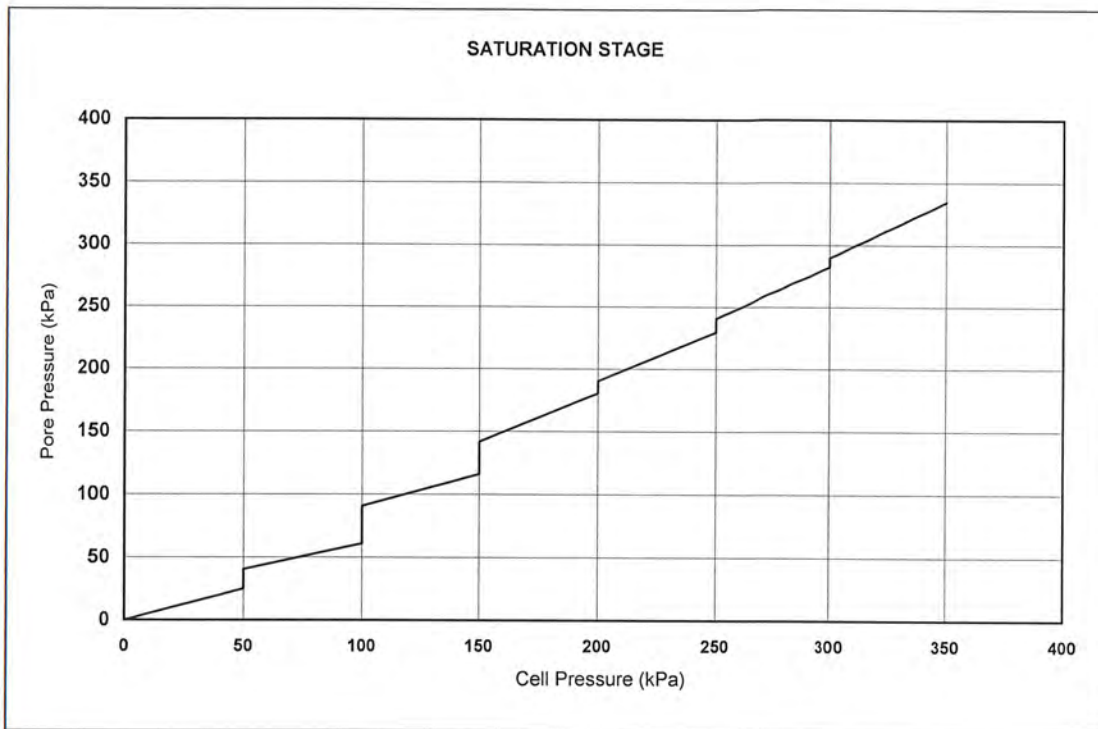


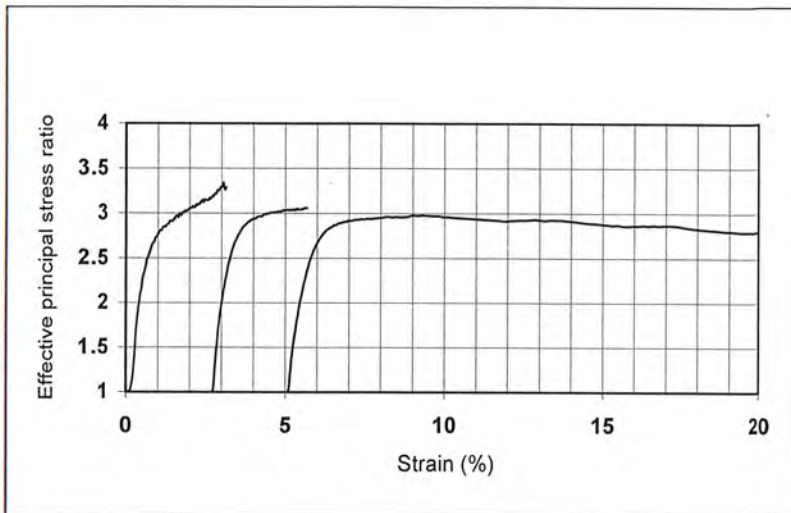
PROJECT No : 4322A CLIENT : AMEY OW Limited

PROJECT : A66 North Trans Pennine Sceme C Section 9

HOLE : BH SBC032A SAMPLE No : U3

DEPTH (m) : 5.00



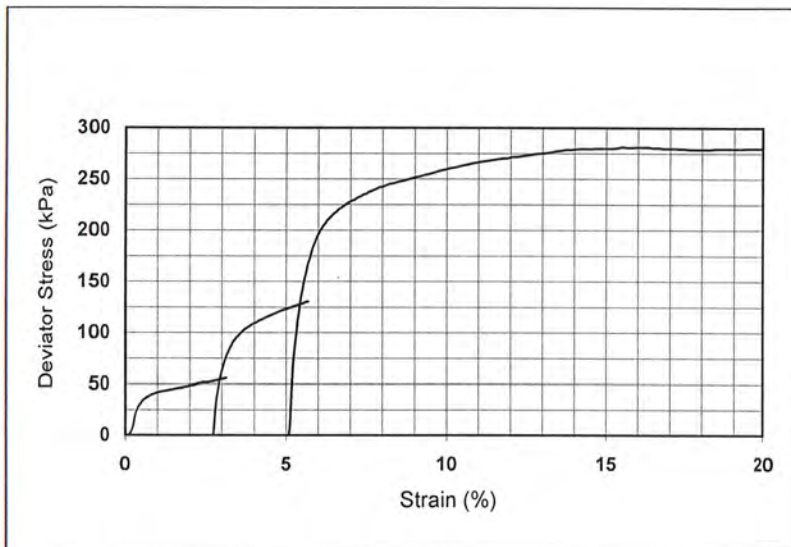


**Failure Conditions**

At maximum stress ratio

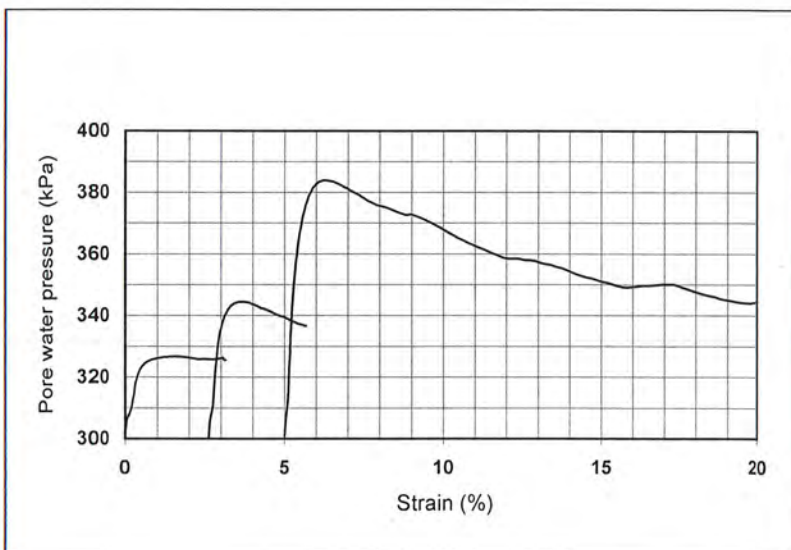
**Stage 1**

strain                      3.06 %  
 deviator stress          55.3 kPa  
 stress ratio              3.34



**Stage 2**

strain                      5.64 %  
 deviator stress          130.5 kPa  
 stress ratio              3.06



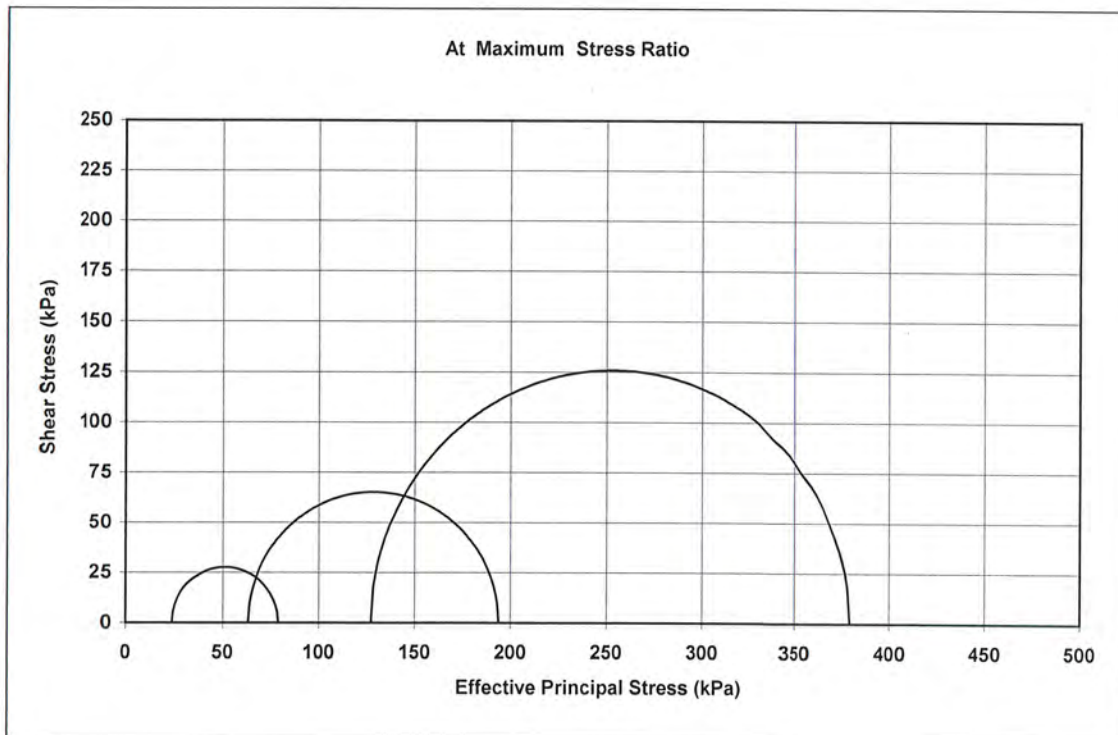
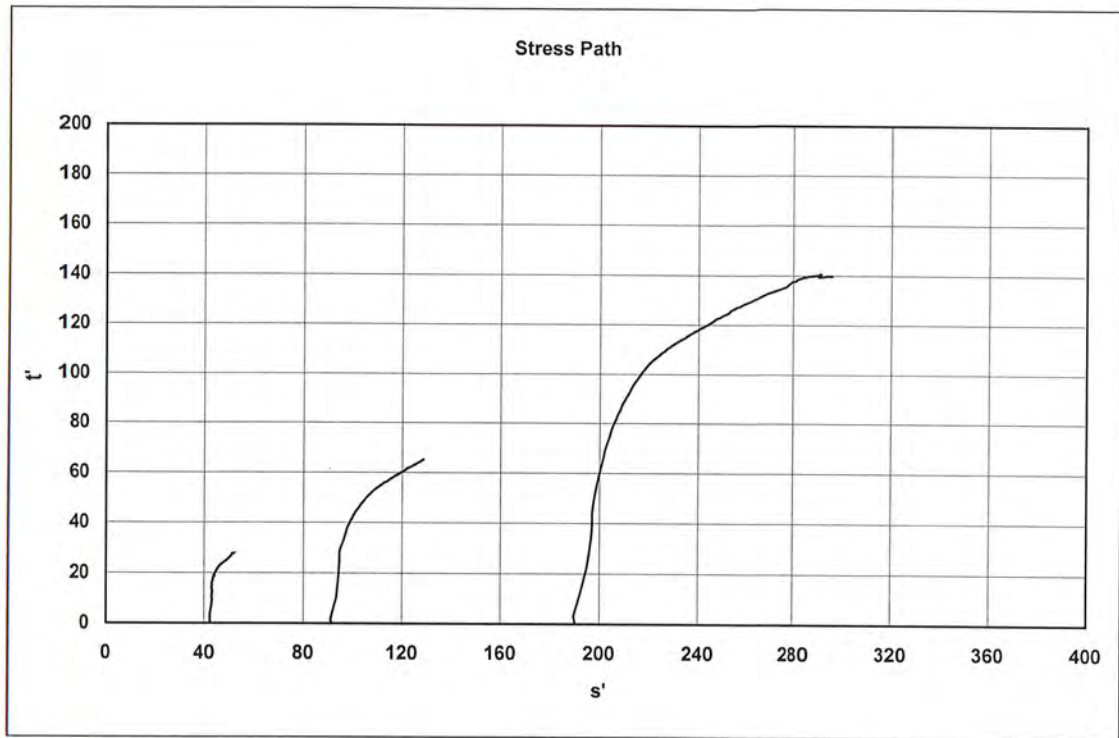
**Stage 3**

strain                      8.99 %  
 deviator stress          251.7 kPa  
 stress ratio              2.98



**FAILURE MODE**





## Moisture Content of Rock



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## MOISTURE CONTENT CERTIFICATE

ISRM : 1981

Exploratory Hole No.	Sample Depth (m)	Sample ID	Moisture Content (%)	Date Tested	Remarks
BH SBC001	1.70	C11	23.0	24/03/2021	
BH SBC001	3.35	C13	8.8	24/03/2021	
BH SBC001	6.40	C15	8.0	24/03/2021	
BH SBC006	5.50	C20	7.9	24/03/2021	
BH SBC007	4.30	C16	7.6	24/03/2021	
BH SBC007	7.40	C19	6.3	24/03/2021	
BH SBC009	6.00	C18	6.9	24/03/2021	
BH SBC014A	21.25	C33	15.7	24/03/2021	
BH SBC015	23.60	C57	2.1	24/03/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 9	Client :- AMEY OW Limited
---	------------------------------

	Signed : [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 1 of 1	
	Date of issue :- 26/03/2021	Certificate No :- RMC/4322A/1	AEG Contract No. :- 4322A	

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)	BULK DENSITY (Mg/m <sup>3</sup> )	DRY DENSITY (Mg/m <sup>3</sup> )
BH SBC014A	C	17.10	8.7	-	-
BH SBC014A	C	21.67	17.5	-	-

Tested in accordance with ISRM (2007)

**SUMMARY OF WATER CONTENT  
AND DENSITY TEST RESULTS**



## Determination of Point Load Index

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5BL - Tel: [REDACTED]

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)±	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC001	1.57	Axial	82.2	45.7	1.7	4783.0	0.35	1.16	0.399	Sandstone #	16/04/2021
BH SBC001	1.64	Axial	88.7	38.4	11.6	4336.8	2.68	1.13	3.029	Sandstone	16/04/2021
BH SBC001	2.20	Axial	86.1	50.9	0.3	5580.0	0.05	1.2	0.061	Mudstone	16/04/2021
BH SBC001	2.26	Axial	86.6	22.6	0.3	2491.9	0.1	1	0.104	Mudstone	16/04/2021
BH SBC001	2.35	Axial	86.2	22.7	0.4	2491.4	0.14	1	0.142	Mudstone	16/04/2021
BH SBC001	2.60	Axial	86.3	51.9	0.5	5702.8	0.09	1.2	0.109	Mudstone	16/04/2021
BH SBC001	2.80	Axial	85.6	39.8	0.6	4337.8	0.14	1.13	0.159	Mudstone	16/04/2021
BH SBC001	2.90	Axial	85.6	66.6	1.8	7258.7	0.24	1.27	0.31	Sandstone/Mudstone	16/04/2021
BH SBC001	3.00	Diametral	112.0	82.2	0.2	6756.8	0.03	1.25	0.043	Mudstone/Siltstone #	16/04/2021
BH SBC001	3.00	Axial	86.7	31.4	2.2	3466.2	0.64	1.08	0.693	Mudstone	16/04/2021
BH SBC001	3.10	Axial	86.4	37.0	1.3	4070.3	0.31	1.12	0.35	Mudstone/Siltstone	16/04/2021
BH SBC001	3.20	Axial	86.8	55.9	1.3	6122.7	0.22	1.22	0.264	Mudstone/Siltstone	16/04/2021
BH SBC001	3.55	Axial	86.3	48.2	1.3	5296.2	0.24	1.18	0.28	Mudstone/Siltstone	16/04/2021
BH SBC001	3.62	Axial	86.2	57.3	0.6	6288.9	0.09	1.23	0.109	Mudstone/Siltstone	16/04/2021

NOTES - + Tested specimen measured using calibrated vernier callipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/1	Sign [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 1 of 10	
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9		AEG Contract No :- 4322A		



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RQ  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Bloorburn, BB1 5BL - UK

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC001	3.80	Axial	86.4	45.0	0.6	4950.4	0.12	1.17	0.136	Mudstone/Siltstone #	16/04/2021
BH SBC001	3.90	Diametral	111.5	84.7	0.3	7174.1	0.04	1.27	0.05	Mudstone/Siltstone #	16/04/2021
BH SBC001	3.90	Axial	86.0	42.5	0.7	4653.7	0.16	1.15	0.179	Mudstone/Siltstone	16/04/2021
BH SBC001	4.00	Axial	86.9	21.0	2.6	2323.5	1.1	0.98	1.084	Mudstone/Siltstone	16/04/2021
BH SBC001	4.65	Axial	86.4	42.1	2.3	4631.3	0.5	1.15	0.574	Mudstone/Siltstone	16/04/2021
BH SBC001	4.77	Axial	86.7	60.8	1.5	6711.7	0.23	1.25	0.287	Mudstone/Siltstone	16/04/2021
BH SBC001	4.85	Axial	85.9	34.6	1.7	3784.2	0.45	1.1	0.499	Mudstone/Siltstone	16/04/2021
BH SBC001	5.14	Axial	86.5	28.0	4.1	3083.2	1.33	1.05	1.398	Sandstone/Siltstone	16/04/2021
BH SBC001	5.20	Axial	86.6	40.1	5.0	4421.5	1.14	1.14	1.295	Sandstone/Siltstone	16/04/2021
BH SBC001	5.38	Axial	85.9	19.9	1.1	2176.5	0.51	0.97	0.492	Mudstone/Siltstone	16/04/2021
BH SBC001	5.45	Axial	86.3	18.6	0.5	2043.8	0.23	0.96	0.219	Mudstone/Siltstone #	16/04/2021
BH SBC001	5.55	Axial	86.2	27.4	3.9	3007.2	1.3	1.04	1.352	Mudstone/Siltstone	16/04/2021
BH SBC001	5.70	Axial	86.1	47.8	0.8	5240.1	0.15	1.18	0.177	Mudstone/Siltstone #	16/04/2021
BH SBC001	5.75	Axial	86.3	40.4	5.6	4439.2	1.26	1.14	1.439	Sandstone/Mudstone	16/04/2021

NOTES - + Tested specimen measured using calibrated vernier callipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/2	Sign [Redacted]	Name :- <b>M. SELKIRK</b>	Page 2 of 10	
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A			

1367

# ALLIED EXPLORATION & GEOTECHNICS LIMITED



Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2  
Regional Office: Unit 20, Business Development Centre, Ebanham Wharf, Blackburn, BB1 5BL

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC001	5.95	Axial	86.2	28.4	3.7	3117.0	1.2	1.05	1.257	Sandstone/Mudstone	16/04/2021
BH SBC001	6.15	Axial	85.4	36.8	10.7	4001.4	2.68	1.11	2.981	Sandstone/Mudstone	16/04/2021
BH SBC001	6.30	Axial	81.1	42.9	14.8	4429.8	3.34	1.14	3.795	Sandstone/Mudstone	16/04/2021
BH SBC001	6.47	Diametral	104.4	82.3	1.1	6773.3	0.16	1.25	0.204	Sandstone/Mudstone #	16/04/2021
BH SBC001	6.47	Axial	86.7	42.5	14.7	4691.6	3.14	1.15	3.618	Sandstone/Mudstone	16/04/2021
BH SBC001	6.80	Diametral	131.5	82.7	1.5	6839.3	0.22	1.25	0.272	Mudstone/Siltstone #	16/04/2021
BH SBC001	6.80	Axial	86.2	36.7	7.2	4027.9	1.79	1.11	1.992	Mudstone/Siltstone	16/04/2021
BH SBC001	6.94	Diametral	102.2	80.0	0.8	6400.0	0.12	1.24	0.146	Siltstone #	16/04/2021
BH SBC001	6.94	Axial	86.1	18.9	4.4	2071.9	2.14	0.96	2.051	Siltstone	16/04/2021
BH SBC001	7.05	Axial	86.1	33.5	6.8	3672.5	1.85	1.09	2.014	Mudstone/Siltstone	16/04/2021
BH SBC005	6.27	Axial	86.5	18.5	1.0	2037.5	0.49	0.96	0.469	Mudstone	22/04/2021
BH SBC005	6.35	Axial	86.7	25.1	1.2	2770.8	0.43	1.02	0.443	Mudstone	22/04/2021
BH SBC005	6.40	Irregular Lump	84.7	21.4	1.0	2307.9	0.43	0.98	0.426	Mudstone	22/04/2021
BH SBC005	6.75	Axial	86.7	20.3	1.0	2240.9	0.45	0.98	0.435	Mudstone	22/04/2021

NOTES - + Tested specimen measured using calibrated vernier callipers # -Invalid Failure (Did not pass through both points) ! -Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/3	Signature :- [Redacted]	Name :- <b>M SELKIRK</b>	Page 3 of 10	
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A			



# ALLIED EXPLORATION & GEOTECHNICS LIMITED



Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG.  
Regional Office: Unit 20, Business Development Centre, Etnam Wharf, Blackburn, BB1 5BL. Tel: [REDACTED]

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC005	6.80	Axial	86.7	22.9	1.1	2527.9	0.44	1	0.436	Mudstone	22/04/2021
BH SBC005	6.95	Axial	86.7	30.6	1.3	3377.9	0.38	1.07	0.412	Mudstone	22/04/2021
BH SBC006	5.60	Axial	87.2	26.1	1.3	2897.8	0.45	1.03	0.464	Mudstone	22/04/2021
BH SBC006	5.80	Irregular Lump	57.7	36.8	1.2	2703.6	0.44	1.02	0.452	Mudstone	22/04/2021
BH SBC006	6.00	Axial	86.5	24.6	1.2	2709.3	0.44	1.02	0.451	Mudstone	22/04/2021
BH SBC006	6.45	Axial	86.7	20.9	1.1	2307.2	0.48	0.98	0.468	Mudstone	22/04/2021
BH SBC006	6.65	Axial	86.5	33.7	1.8	3711.6	0.48	1.09	0.53	Mudstone	22/04/2021
BH SBC006	6.80	Axial	86.7	38.9	1.6	4294.2	0.37	1.13	0.421	Mudstone	22/04/2021
BH SBC007	4.24	Irregular Lump	86.4	20.3	0.9	2233.2	0.4	0.97	0.393	Mudstone	22/04/2021
BH SBC007	4.50	Irregular Lump	87.1	41.9	1.0	4646.7	0.22	1.15	0.247	Mudstone	22/04/2021
BH SBC007	4.66	Irregular Lump	59.6	20.6	2.2	1563.2	1.41	0.9	1.266	Mudstone	22/04/2021
BH SBC007	4.90	Irregular Lump	88.1	25.3	1.8	2838.0	0.63	1.03	0.653	Mudstone #	22/04/2021
BH SBC007	5.00	Irregular Lump	88.1	34.1	1.4	3825.1	0.37	1.1	0.403	Mudstone #	22/04/2021
BH SBC007	5.20	Irregular Lump	86.9	47.9	1.6	5299.9	0.3	1.18	0.358	Mudstone	22/04/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # - Invalid Failure (Did not pass through both points) ! - Too soft to register a reading

 Date of issue :- 30/04/2021 Certificate No :- PL/4322A/4 Client :- AMEY OW Limited	Signature [REDACTED]	Name :- <b>M. SELKIRK</b>	Page 4 of 10
			AEG Contract No :- 4322A
Contract Title :- A66 North Trans Pennine Scheme C Section 9			

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL - 10

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC007	5.86	Axial	87.2	36.4	0.4	4041.4	0.1	1.11	0.11	Mudstone	22/04/2021
BH SBC007	5.90	Axial	85.8	24.3	2.1	2654.6	0.79	1.01	0.802	Mudstone	22/04/2021
BH SBC007	5.95	Axial	85.9	25.1	0.9	2745.2	0.33	1.02	0.335	Mudstone	22/04/2021
BH SBC007	6.03	Axial	85.8	28.3	0.7	3091.6	0.23	1.05	0.238	Mudstone #	22/04/2021
BH SBC007	6.20	Irregular Lump	65.4	16.1	2.2	1340.6	1.64	0.87	1.426	Mudstone	22/04/2021
BH SBC007	6.30	Axial	86.5	35.9	2.3	3953.9	0.58	1.11	0.645	Mudstone	22/04/2021
BH SBC007	6.80	Axial	87.0	54.8	1.4	6070.3	0.23	1.22	0.282	Mudstone	22/04/2021
BH SBC007	6.90	Axial	86.8	44.9	2.3	4962.2	0.46	1.17	0.541	Mudstone	22/04/2021
BH SBC007	7.52	Axial	86.8	48.3	3.4	5338.0	0.64	1.19	0.755	Mudstone	22/04/2021
BH SBC007	7.60	Axial	86.0	39.1	1.4	4281.4	0.33	1.13	0.369	Mudstone #	22/04/2021
BH SBC007	7.84	Axial	86.8	66.2	3.1	7316.2	0.42	1.27	0.54	Mudstone	22/04/2021
BH SBC007	8.08	Axial	86.3	56.7	1.3	6230.2	0.21	1.23	0.256	Mudstone	22/04/2021
BH SBC007	8.10	Axial	86.5	41.3	1.4	4548.6	0.31	1.14	0.352	Mudstone	22/04/2021
BH SBC007	8.20	Axial	86.0	21.4	1.6	2343.3	0.68	0.99	0.673	Mudstone	22/04/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) ! -Too soft to register a reading

<b>Date of issue :-</b> 30/04/2021	<b>Certificate No :-</b> PL/4322A/5	<b>Signature</b> 	<b>Name :-</b> <b>M. SELKIRK</b>
<b>Client :-</b> AMEY OW Limited	<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9	<b>Page 5 of 10</b>	<b>AEG Contract No :-</b> 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RQ  
Regional Office: Unit 20, Business Development Centre, Eaman Wharf, Blackburn, BB1 5BL - UK

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC007	8.42	Axial	86.5	29.5	1.0	3249.0	0.31	1.06	0.326	Mudstone	22/04/2021
BH SBC007	8.50	Axial	86.5	33.1	2.4	3645.5	0.66	1.09	0.717	Mudstone	22/04/2021
BH SBC007	8.60	Axial	86.0	37.4	2.2	4095.3	0.54	1.12	0.6	Mudstone #	22/04/2021
BH SBC007	8.65	Axial	86.5	39.5	2.7	4350.3	0.62	1.13	0.703	Mudstone	22/04/2021
BH SBC009	6.55	Diametral	110.8	82.6	3.3	6822.8	0.48	1.25	0.606	Mudstone	22/04/2021
BH SBC009	6.55	Axial	86.7	30.9	3.5	3411.1	1.03	1.07	1.1	Mudstone	22/04/2021
BH SBC009	6.66	Axial	86.7	47.5	4.9	5243.5	0.93	1.18	1.104	Mudstone	22/04/2021
BH SBC009	6.70	Axial	86.7	41.2	3.5	4548.1	0.77	1.14	0.88	Mudstone	22/04/2021
BH SBC009	6.80	Axial	86.7	37.4	5.9	4128.6	1.43	1.12	1.6	Mudstone	22/04/2021
BH SBC009	6.86	Axial	86.4	36.1	6.1	3971.3	1.54	1.11	1.705	Mudstone	22/04/2021
BH SBC009	6.95	Axial	86.3	49.1	2.3	5395.1	0.43	1.19	0.507	Mudstone #	22/04/2021
BH SBC009	7.05	Irregular Lump	87.9	42.3	5.1	4734.1	1.08	1.15	1.244	Mudstone	22/04/2021
BH SBC009	7.35	Irregular Lump	87.4	33.1	2.3	3683.4	0.62	1.09	0.681	Mudstone	22/04/2021
BH SBC009	7.40	Axial	87.4	22.4	2.7	2492.7	1.08	1	1.082	Mudstone	22/04/2021

NOTES -- + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) ! - Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/6	Signed [Redacted]	Name :- <b>M. SELKIRK</b>	Page 6 of 10	
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A			

# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL - Tel

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH-SBC009	7.50	Diametral	174.1	74.5	3.2	5550.3	0.58	1.2	0.69	Mudstone	29/04/2021
BH-SBC009	7.50	Axial	85.8	62.7	4.4	6849.6	0.64	1.25	0.806	Mudstone	29/04/2021
BH-SBC009	8.00	Diametral	146.7	76.2	4.7	5806.4	0.81	1.21	0.978	Mudstone	29/04/2021
BH-SBC009	8.00	Axial	86.7	49.6	4.1	5475.3	0.75	1.19	0.893	Mudstone	29/04/2021
BH-SBC009	8.50	Diametral	104.0	81.9	4.8	6707.6	0.72	1.25	0.894	Mudstone	29/04/2021
BH-SBC009	8.50	Axial	87.1	29.0	3.1	3216.1	0.96	1.06	1.02	Mudstone	29/04/2021
BH-SBC009	8.80	Diametral	172.9	73.8	3.8	5446.4	0.7	1.19	0.831	Mudstone	29/04/2021
BH-SBC009	8.80	Axial	86.6	69.7	1.4	7685.3	0.18	1.29	0.235	Mudstone #	29/04/2021
BH-SBC009	9.30	Diametral	126.0	72.9	3.7	5314.4	0.7	1.18	0.825	Mudstone	22/04/2021
BH-SBC009	9.30	Axial	87.3	56.3	3.2	6258.0	0.51	1.23	0.629	Mudstone	22/04/2021
BH-SBC009	9.45	Axial	87.0	36.2	3.2	4009.9	0.8	1.11	0.888	Mudstone	22/04/2021
BH-SBC009	9.50	Axial	87.7	66.7	2.0	7447.9	0.27	1.28	0.343	Mudstone #	22/04/2021
BH-SBC009	9.90	Axial	87.1	45.4	2.1	5034.8	0.42	1.17	0.488	Mudstone	22/04/2021
BH-SBC009	10.00	Axial	87.0	36.9	4.0	4087.5	0.98	1.12	1.093	Mudstone	22/04/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both points) !-Too soft to register a reading

<b>Date of issue :-</b> 30/04/2021	<b>Certificate No :-</b> PL/4322A/7	<b>Signed :-</b> 	<b>Name :-</b> M. SELKIRK
<b>Client :-</b> AMEY OW Limited	<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9	<b>Page 7 of 10</b>	<b>AEG Contract No :-</b> 4322A





# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 5BL, UK

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC009	10.10	Axial	87.2	34.5	3.8	3830.4	0.99	1.1	1.092	Mudstone	22/04/2021
BH SBC009	10.30	Axial	87.0	30.2	0.7	3345.3	0.21	1.07	0.223	Mudstone #	22/04/2021
BH SBC009	10.35	Axial	87.1	68.8	1.6	7629.9	0.21	1.29	0.27	Mudstone #	22/04/2021
BH SBC009	10.40	Axial	86.6	71.6	1.7	7894.8	0.22	1.3	0.279	Mudstone #	22/04/2021
BH SBC014A	19.65	Diametral	159.3	75.3	15.0	5670.1	2.65	1.2	3.181	Sandstone	29/04/2021
BH SBC014A	19.90	Diametral	129.6	78.5	0.2	6162.3	0.03	1.23	0.04	Siltstone	29/04/2021
BH SBC014A	19.90	Axial	85.5	53.2	0.3	5791.5	0.05	1.21	0.063	Siltstone	29/04/2021
BH SBC014A	20.00	Irregular Lump	49.3	47.7	1.0	2994.2	0.33	1.04	0.348	Sandstone	29/04/2021
BH SBC014A	20.15	Irregular Lump	84.8	50.6	4.6	5463.3	0.84	1.19	1.004	Sandstone	29/04/2021
BH SBC014A	20.80	Irregular Lump	57.8	33.6	3.4	2472.7	1.37	1	1.372	Sandstone #	29/04/2021
BH SBC014A	20.90	Irregular Lump	78.2	55.5	1.7	5526.0	0.31	1.2	0.368	Sandstone	29/04/2021
BH SBC014A	21.00	Diametral	94.4	82.6	2.3	6822.8	0.34	1.25	0.423	Sandstone	29/04/2021
BH SBC014A	21.00	Axial	85.9	41.6	0.3	4549.9	0.07	1.14	0.075	Sandstone #	29/04/2021
BH SBC014A	21.10	Diametral	91.9	82.1	0.3	6740.4	0.04	1.25	0.056	Sandstone	29/04/2021

NOTES - + Tested specimen measured using calibrated vernier callipers # -Invalid Failure (Did not pass through both-points) ! -Too soft to register a reading

<b>Date of issue :-</b> 30/04/2021	<b>Certificate No :-</b> PL/4322A/8	<b>Signed :-</b> 	<b>Name :-</b> <b>M. SELKIRK</b>
<b>Client :-</b> AMEY OW Limited	<b>Contract Title :-</b> A66 North Trans Pennine Scheme C Section 9		<b>Page 8 of 10</b> AEG Contract No :- 4322A



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2R  
Regional Office: Unit 20, Business Development Centre, Eanan Wharf, Blackburn, BB1 5BL, UK

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC014A	21.10	Axial	85.4	36.0	1.7	3914.5	0.43	1.11	0.48	Sandstone	29/04/2021
BH SBC014A	24.60	Irregular Lump	88.5	36.1	5.0	4067.8	1.23	1.12	1.371	Sandstone	29/04/2021
BH SBC014A	24.70	Irregular Lump	99.5	41.2	7.2	5219.5	1.38	1.18	1.628	Sandstone	29/04/2021
BH SBC014A	24.80	Irregular Lump	80.1	38.2	2.6	3895.9	0.67	1.1	0.737	Sandstone	29/04/2021
BH SBC014A	24.90	Irregular Lump	93.4	49.6	3.8	5898.5	0.64	1.21	0.781	Sandstone	29/04/2021
BH SBC014A	25.00	Irregular Lump	81.8	28.5	2.7	2968.3	0.91	1.04	0.945	Sandstone	29/04/2021
BH SBC014A	25.08	Axial	85.7	44.7	0.4	4877.5	0.08	1.16	0.095	Siltstone	29/04/2021
BH SBC014A	25.10	Irregular Lump	74.7	40.2	2.6	3823.5	0.68	1.1	0.748	Sandstone	29/04/2021
BH SBC014A	25.30	Diametral	121.6	81.6	0.1	6658.6	0.02	1.25	0.019	Siltstone	29/04/2021
BH SBC014A	25.30	Axial	84.1	41.9	0.4	4486.6	0.09	1.14	0.102	Siltstone	29/04/2021
BH SBC015	23.50	Irregular Lump	114.3	53.2	8.5	7742.3	1.1	1.29	1.416	Sandstone	29/04/2021
BH SBC015	23.65	Irregular Lump	148.5	33.3	9.5	6296.2	1.51	1.23	1.857	Sandstone	29/04/2021
BH SBC015	23.75	Irregular Lump	137.3	17.6	7.2	3076.8	2.34	1.05	2.452	Sandstone	29/04/2021
BH SBC015	23.90	Irregular Lump	126.4	33.7	14.5	5423.6	2.67	1.19	3.182	Sandstone	29/04/2021

NOTES - + Tested specimen measured using calibrated vernier calipers # -Invalid Failure (Did not pass through both-points) ! -Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/9	Signed :- [Redacted]	Name :- <b>M. SELKIRK</b>	Page 9 of 10
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		UKAS TESTING 1367



# ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20, Business Development Centre, Easing Wharf, Blackburn, BB1 3BL - Tel

## POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)+	Failure Load (kN)*	De <sup>2</sup> (mm <sup>2</sup> )	Point Load (IS) (MPa)	Size Factor	Point Load Index (IS50) (MPa)	Type	Date Tested
BH SBC015	24.00	Diametral	226.5	72.2	28.0	5212.8	5.37	1.18	6.337	Sandstone	29/04/2021
BH SBC015	24.00	Axial	86.4	68.5	29.4	7535.5	3.9	1.28	5.001	Sandstone #	29/04/2021
BH SBC015	24.40	Diametral	143.4	70.0	20.2	4900.0	4.12	1.16	4.796	Sandstone	29/04/2021
BH SBC015	24.40	Axial	85.7	42.5	24.2	4637.5	5.22	1.15	5.997	Sandstone	29/04/2021
BH SBC015	24.60	Diametral	129.2	77.3	25.0	5975.3	4.18	1.22	5.09	Sandstone	29/04/2021

NOTES - + Tested specimen measured using calibrated vernier calipers #-Invalid Failure (Did not pass through both points) !-Too soft to register a reading

	Date of issue :- 30/04/2021	Certificate No :- PL/4322A/10	Signed [Redacted]	Name :- <b>M. SELKIRK</b>	Page 10 of 10
	Client :- AMEY OW Limited	Contract Title :- A66 North Trans Pennine Scheme C Section 9	AEG Contract No :- 4322A		