



Mr T Daley
Armstrong Projects Ltd
The Annexe
Rear of 26 Church Street
Altrincham
WA14 4DW

BY EMAIL

Our Ref: NW149/02/OGjcl5

7th February 2024

Dear Tom

Smithybridge Pub, Littleborough
Supplementary Site Investigation

In accordance with our commission, we visited the above site between 8th and 10th January 2024 to undertake further investigation by means of deep boreholes on site, to confirm ground conditions at depth. This was considered to be required as a result of the presence of deep mixed/variable deposits preventing the use of conventional strip/trench fill or pad foundations, and necessitating the use of specialist foundations, probably to a greater depth.

Background

The original site investigation, comprising hand pits and windowless sample boreholes, was undertaken by ARP between 6th and 7th September 2021. The findings of the report are included in the Combined Stage 1 and Stage 2 Geo-environmental Report, NW149/02r1V2, dated 5th November 2021.

The ground investigation revealed bitmac surfacing between 0.1m and 0.2m thick, with localised areas of topsoil cover up to 0.3m thick. Underlying the bitmac hardstanding, made ground was present, to depths of between 0.4m (WS1) and 1.0m (WS2 & WS3). The made ground typically comprised dark grey sandy, fine to coarse, angular gravel of mixed lithology, sandstone and locally brick. Made ground was identified in all six windowless sample boreholes.

Beneath the topsoil and made ground, identified above, were highly variable glacial diamicton deposits comprising intercalated sequences of clay, sand and gravels. In WS1, firm/medium strength slightly sandy gravelly clay with occasional cobbles was encountered to a depth of 2m, where it was underlain by firm reddish-brown clay to 3.7m. These were subsequently underlain by orange clayey fine-grained sands and clays to the base of the borehole.

In WS2, loose brown slightly sandy clayey gravels were present beneath the made ground to a depth of 2.8m, and subsequently underlain by firm glacial clays and loose sands to the base of the borehole. In WS4, loose dark grey very silty sand was present to a depth of 1.6m, underlain by firm glacial clays to 2.4m, and underlain again by loose dark grey clayey silty sand to the base of the borehole at 3.45m. WS3, WS5, and WS6, revealed similar sequences of soft to firm clays and loose to medium dense sands to the base of the boreholes.



The windowless sample cores were noted to be wet in all of the investigation boreholes, from depths of between 1m and 3m. The groundwater typically coincided with the presence of sands and gravels. In WS2, the water strike was very severe, with the majority of the volume of the core tube comprising water.

Rockhead was not encountered in any of the windowless sample boreholes. One dynamic probe (DP1) was drilled from the base of WS1 to a depth of 10m and the probe results indicated that bedrock is not present within the upper 10m of the surface.

The site is proposed for three storey apartments, which will induce higher foundation loads than standard two storey residential properties. Made ground, and the underlying variable superficial strata (low to medium strength clays and loose to medium dense sands and gravels) are not considered suitable for support of strip/trench fill foundations, due to the risk of excessive settlements and/or foundation failure, especially when the shallow groundwater is taken into account for the granular strata. An alternative foundation solution is required.

In order to confirm the soil profile at depth, and to assist with future foundation design, it was recommended that cable percussion boreholes should be undertaken.

Site Works

The additional investigation was undertaken between 8th and 10th January 2024 prior to the demolition of the former pub. The investigation comprised the formation of two cable percussive boreholes (BH1 and BH2) to respective depths of 14.4m and 15.45m.

An exploratory hole location plan is attached, together with the borehole logs.

Geotechnical Testing

Particle Size Distribution Tests were undertaken on three samples obtained during the site investigation:

BH1 sample B5, at 3.2m to 4.0m
BH2 sample B10, at 7.0m to 8.0m
BH2 sample B12, at 8.0m to 9.0m

Sedimentation, to determine the silt and clay fractions, was also specified, on all three samples. A total of six plasticity index and moisture content tests were also undertaken throughout both boreholes. The geotechnical test results are attached.

Ground Conditions

The supplementary cable percussive site investigation identified highly variable glacial diamicton deposits comprising a sequence of firm, becoming stiff, clay (with pockets of sand) and medium dense sand (with cobble sized pockets of clay) to the base of the boreholes. Borehole BH02 terminated at 14.4m at refusal, this is interpreted to be on bedrock although no recovery was possible to confirm this.



The SPT 'N' values within the upper 3m of the cohesive deposits ranged from between 9 and 14 indicating borderline low/medium strength. From 3m depth, the 'N' value within the cohesive deposits ranged between 11 and 26, indicating medium to high strength.

The SPT 'N' value within the granular deposits ranged between 18 and 41, indicating medium dense to dense.

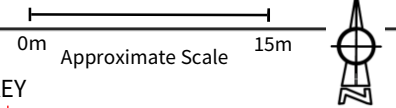
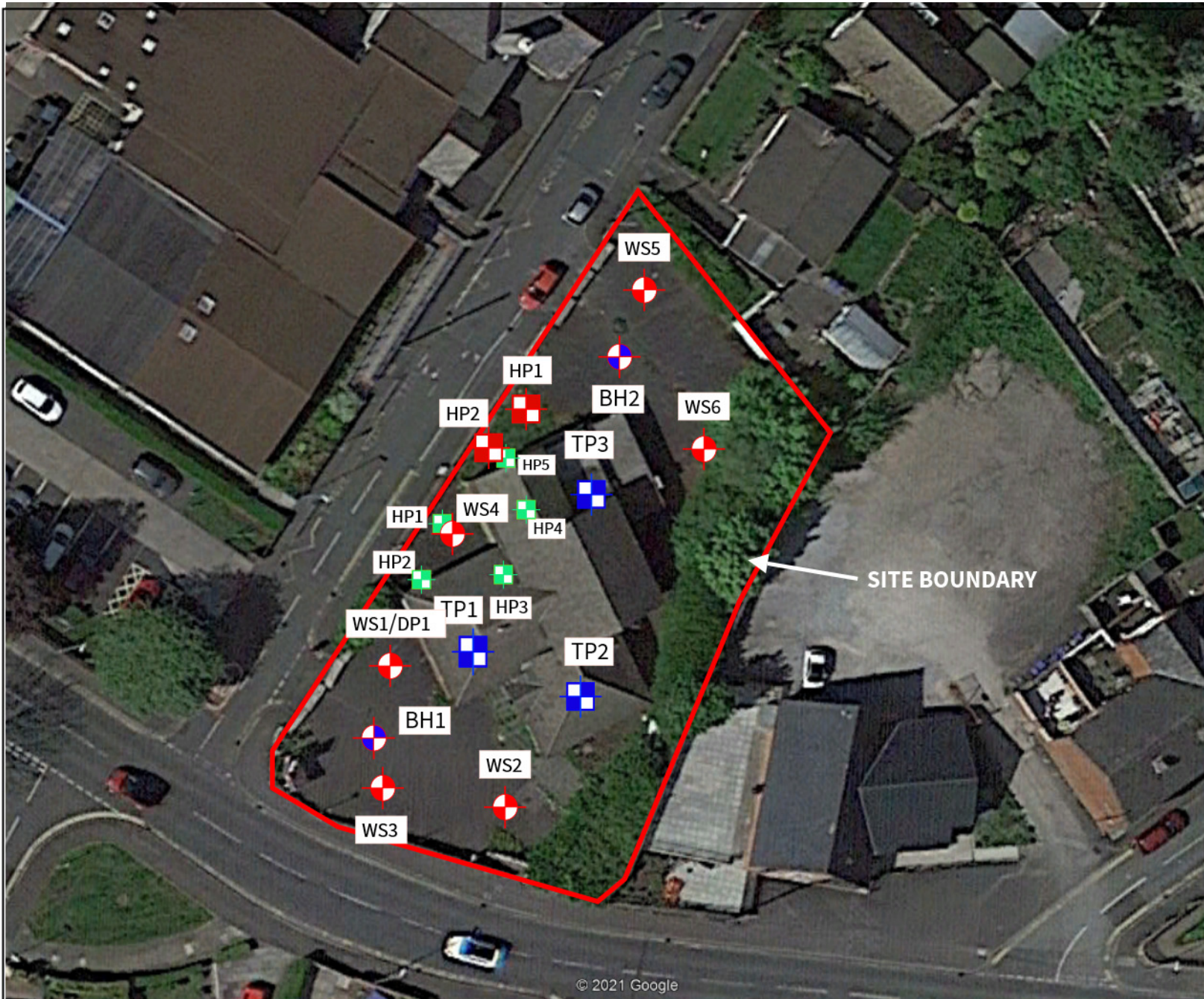
We trust the above information, and attachments, are sufficient for your requirements, but if you have any comments or queries, please do not hesitate to contact us at your convenience.

Yours sincerely
for ARP (NORTH WEST)

A handwritten signature in black ink, appearing to be 'O Gwilym'.

O Gwilym

Encs



- KEY**
- Windowless Sample Boreholes (2021)
WS1
 - Dynamic probe (2021)
DP
 - Hand Pits (2021)
HP1
 - Cable Percussive boreholes (2024)
BH1
 - Post demolition trial pits (2024)
 - Post demolition hand pits surrounding WS4 (2024)

ARP
ARP NORTH WEST LTD
CHARTERED CONSULTING ENGINEERS
2nd Floor · 3 Hardman Square · Manchester M3 3EB
Telephone : 0113 245 8498 · E-Mail : manchester@arnorthwest.co.uk

Project	THE FORMER SMITHYBRIDGE PUB LITTLEBOROUGH	
Client	ARMSTRONG PROJECTS LTD	
Title	COMBINED SITE INVESTIGATION PLAN	
Date	JANUARY 2024	
Drawn	OG	Scale AS SHOWN
Job No.	NW149/02	



ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS

Site
Smithybridge Pub, Littleborough

Borehole Number
BH01

Machine : CP Dando 2000		Casing Diameter 200mm cased to 4.00m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
Method : Cable Percussion		Location		Dates 09/01/2024		Engineer OG		Sheet 1/2	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40-1.00	B1					(0.20) 0.20 (0.20) 0.40	Tarmac (Driller's Description) Made Ground: Brick hardcore (Driller's Description) Firm, borderline low/medium strength, brown gravelly sandy CLAY with medium cobble content. Gravel is sub angular to angular, fine to medium of mixed lithologies including sandstone. Cobbles are sub angular of sandstone.		
1.00-1.45 1.00-1.45	SPT(C) N=9 D2			1,1/2,2,2,3		(2.80)			
2.00-2.45 2.00-2.45	SPT(C) N=9 D3			1,2/2,2,2,3					
3.00-3.45 3.00-3.45 3.20-4.00	SPT(C) N=13 D4 B5			1,1/2,3,3,5		3.20 (0.25) 3.45	Firm, medium strength, orangish brown slightly gravelly sandy CLAY with cobble sized pockets of orangish brown fine to medium sand. Gravel is sub angular to sub rounded of sandstone.		
4.00-4.45 4.00-4.45	SPT(C) N=20 D6			2,3/4,5,5,6		(2.00)	Medium dense orangish brown silty clayey fine to medium SAND with frequent cobble sized pockets of firm clay		
5.00-5.45 5.00-5.45	SPT(C) N=18 D7			4,5/4,5,4,5		5.45	Firm, high strength, brown occasionally reddish brown slightly gravelly sandy CLAY with frequent cobble size pockets of orangish brown fine to medium sand. Gravel is sub angular to sub rounded fine to medium of mixed lithologies including sandstone.		
6.00	D8								
6.50-6.95 6.50-6.95	SPT(C) N=16 D9			2,3/3,3,4,6					
7.50	D10								
8.00-8.45 8.00-8.45	SPT(C) N=11 D11			1,1/2,2,3,4			Medium strength from 8m depth.		
9.00	D12								
9.50-9.95 9.50-9.95	SPT(C) N=24 D13			2,3/5,6,6,7		(8.05)	High strength from 9.5m depth.		

Remarks No water strike recorded by driller. Samples noted by engineer to be wet at 9.0m depth and 13.5m depth.								Scale (approx) 1:50	Logged By OG
								Figure No. NW149/02.BH01	

 ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS							Site Smithybridge Pub, Littleborough		Borehole Number BH01
Machine : CP Dando 2000 Method : Cable Percussion		Casing Diameter 200mm cased to 4.00m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
		Location		Dates 09/01/2024		Engineer OG		Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D14						(See previous page for stratum description)		
11.00-11.45 11.00-11.45	SPT(C) N=17 D15			3,3/3,4,5,5					
12.00	D16								
12.50-12.95 12.50-12.95	SPT(C) N=26 D17			3,4/5,5,7,9					
13.50	D18					13.50	Dense reddish brown clayey fine to medium SAND with frequent cobble sized pockets of clay and low cobble content. Cobbles are sub angular of sandstone.		
14.00-14.45	SPT(C) N=40			3,5/7,10,10,13		(1.95)			
15.00-15.45 15.00-15.45	SPT(C) N=39 D19			3,7/10,10,9,10		15.45	Complete at 15.45m		
Remarks No water strike recorded by driller. Samples noted by engineer to be wet at 9.0m depth and 13.5m depth.								Scale (approx) 1:50	Logged By OG
								Figure No. NW149/02.BH01	



Machine : CP Dando 2000		Casing Diameter 200mm cased to 4.00m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
Method : Cable Percussion		Location		Dates 08/01/2024		Engineer OG		Sheet 1/2	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40-1.00	B1					0.10 (0.30) 0.40	Tarmac (Driller's Description) MADE GROUND: Brick hardcore (Driller's description)		
1.00-1.45 1.00-1.45	SPT(C) N=14 D2	2.00		4,4/4,4,3,3		(2.70)	Firm, medium strength, greyish brown and brown gravelly sandy CLAY with moderate cobble content. Gravel is sub angular to sub rounded fine to medium of mixed lithologies including sandstone. Also with cobble sized pockets of fine to medium, sub angular gravel of mixed lithologies.		
2.00-2.45 2.00-2.45	SPT(C) N=12 D3	3.00		3,4/3,3,3,3					
3.00-3.45 3.00-3.45 3.10-4.00	SPT(C) N=9 D4 B5	4.00		1,1/2,2,2,3		3.10	At 3m depth: Borderline low/medium strength Firm, borderline low/medium strength, brown slightly gravelly slightly sandy thinly laminated CLAY with frequent cobble sized pockets of fine sand. Gravel is sub angular to sub rounded fine to medium of sandstone.		
4.00-4.45 4.00-4.45	SPT(C) N=14 D6	4.00		1,1/2,3,4,5		(3.10)	At 4m depth: Medium strength		
5.00-5.45 5.00-5.45	SPT(C) N=27 D7	4.00		3,4/5,6,8,8			At 5m depth: High strength		
6.00	D8					6.20	Firm, borderline medium/high strength, reddish brown sandy thinly laminated sandy silty CLAY with frequent cobble sized pockets of sand.		
6.50-6.95 6.50-6.95	SPT(C) N=15 D9	4.00		2,2/2,3,4,6		(1.70)			
7.00-8.00	B10					7.90	Medium dense becoming dense orangish brown and brown slightly gravelly clayey silty fine to medium SAND with frequent cobble sized pockets of firm clay. Gravel is sub angular, fine to medium, of sandstone.		
8.00-8.45 8.00-8.45 8.00-9.00	SPT(C) N=26 D11 B12	4.00		3,4/4,6,8,8					
9.00	D13								
9.50-9.92 9.50-9.92	SPT(C) 50/270 D14	4.00		5,7/9,13,17,11					

Remarks Water seepage recorded by driller at 2.2m depth. Sample noted by engineer to be wet at 2m, 4m 11m, 12m and 13.5m depth.								Scale (approx) 1:50	Logged By OG
Figure No. NW149/02.BH02									

 ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS							Site Smithybridge Pub, Littleborough		Borehole Number BH02
Machine : CP Dando 2000 Method : Cable Percussion		Casing Diameter 200mm cased to 4.00m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
		Location		Dates 08/01/2024		Engineer OG		Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D15						(See previous page for stratum description)		
11.00-11.45 11.00-11.45	SPT(C) N=32 D16	4.00		5,9/7,9,7,9		(6.10)			
12.00	D17								
12.50-12.95 12.50-12.95	SPT(C) N=41 D18	4.00		3,5/9,9,10,13					
13.50	D19								
14.00-14.40 14.00-14.40	SPT(C) 50/250 D20	4.00		5,7/10,11,13,16		14.00 (0.40) 14.40	Stiff, very high strength, reddish brown sandy CLAY.		
							Complete at 14.40m		
Remarks Water seepage recorded by driller at 2.2m depth. Sample noted by engineer to be wet at 2m, 4m 11m, 12m and 13.5m depth.								Scale (approx) 1:50	Logged By OG
								Figure No. NW149/02.BH02	



Site
Smithybridge Pub, Littleborough

**Trial Pit
Number
HP01**

Machine : Hand Tools
Method : Trial Pit

Dimensions

Ground Level (mOD)

Client
Armstrong Projects Ltd

**Job
Number**
NW149/02

Location

Dates
18/01/2024

Engineer
OG

Sheet
1/1

[illegible]

Remarks
1. Ground checked for services with CAT prior to excavation. 2. No ground water encountered. 3. Hand pit terminated at 0.3m target depth reached. 4. Pit Infilled with arisings to surface.

Scale (approx)	Logged By	Figure No.
1:20	WW	NW149/02.HP0



Site
Smithybridge Pub, Littleborough

**Trial Pit
Number
HP02**

Machine : Hand Tools
Method : Trial Pit

Dimensions

Ground Level (mOD)

Client
Armstrong Projects Ltd

Job Number
NW149/02

Location

Dates
18/01/2024

Engineer
OG

Sheet
1/1

[illegible]

Remarks
Ground checked for services with CAT prior to excavation. No ground water encountered. Hand pit terminated at 0.3m target depth reached. Pit Infilled with arisings to surface.

Scale (approx)	Logged By	Figure No.
1:20	WW	NW149/02.HP02

ARP ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS						Site Smithybridge Pub, Littleborough		Trial Pit Number HP03	
Machine : Hand Tools Method : Trial Pit		Dimensions		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
		Location		Dates 18/01/2024		Engineer OG		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
						Firm reddish brown CLAY.			
					(0.30)				
					0.30	Complete at 0.30m			
Plan						Remarks 1. Ground checked for services with CAT prior to excavation. 2. No ground water encountered. 3. Hand pit terminated at 0.3m target depth reached. 4. Pit Infilled with arisings to surface.			
						Scale (approx)	Logged By	Figure No.	
						1:20	WW	NW149/02.HP03	



Site
Smithybridge Pub, Littleborough

**Trial Pit
Number
HP04**

Machine : Hand Tools
Method : Trial Pit

Dimensions

Ground Level (mOD)

Client
Armstrong Projects Ltd

**Job
Number**
NW149/02

Location

Dates
18/01/2024

Engineer
OG

Sheet
1/1

[illegible]

Remarks

1. Ground checked for services with CAT prior to excavation.
2. No ground water encountered.
3. Hand pit terminated at 0.3m target depth reached.
4. Pit infilled with arisings to surface.

Scale (approx)	Logged By	Figure No.
1:20	WW	NW149/02.HP04



Site
Smithybridge Pub, Littleborough

**Trial Pit
Number
HP05**

Machine : Hand Tools
Method :

Dimensions

Ground Level (mOD)

Client
Armstrong Projects Ltd

**Job
Number**
NW149/02

Location

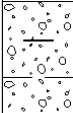
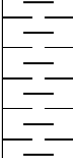
Dates
18/01/2024

Engineer
OG

Sheet
1/1

[illegible]

Remarks		
1. Ground checked for services with CAT prior to excavation. 2. No ground water encountered. 3. Hand pit terminated at 0.3m target depth reached. 4. Pit Infilled with arisings to surface.		
Scale (approx)	Logged By	Figure No.
1:20	WW	NW149/02.HP05

ARP ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS						Site Smithybridge Pub, Littleborough		Trial Pit Number TP01																																																													
Machine : Liebherr Excavator with 1600mm toothed bucket Method : Trial Pit		Dimensions Top of Pit: 3m x 1.6m Bottom of Pit:: 2.5 mx 1.6m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02																																																													
		Location		Dates 18/01/2024		Engineer OG		Sheet 1/1																																																													
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water																																																													
0.30-0.30 0.30-0.30	D J				(0.80)	Light brown sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to rounded of sandstone. Cobbles are subangular to rounded fine brown sandstone.																																																															
					0.80	Firm reddish brown CLAY.																																																															
					(1.20)																																																																
					2.00	Complete at 2.00m																																																															
Plan <table><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr></table>						.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	Remarks 1. Ground checked for services with CAT prior to excavation. 2. Significant water flow from the base of the gravels at 0.8m. 3. Trial pit terminated at 2 m below ground level target depth reached. 4. Pit Infilled with arisings to surface.			
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						Scale (approx) 1:50	Logged By WW	Figure No. NW149/02.TP01																																																													



Machine : Liebherr Excavator with 1600mm thoothed bucket		Dimensions Top of Pit: 3m x 1.6m Bottom of Pit:: 2.5 mx 1.6m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02	
Method : Trial Pit		Location		Dates 18/01/2024		Engineer OG		Sheet 1/1	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.30 0.30-0.30	D J				(0.40) 0.40	MADE GROUND. Dark brown sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse angular to subangular of concrete and sandstone.		
1.00-1.00	SV 40/20 kN/m2				(1.80) 2.20	Firm, medium strength, reddish brown CLAY. From 0.4m to 1.6m depth, on north long wall of pit, lense of light brown sandy fine to coarse sub angular to sub rounded GRAVEL of sandstone with medium cobble content. Cobbles are subangular to rounded fine grained brown sandstone.		
						Complete at 2.20m		

Plan					Remarks			
.	.	.	.	.	1. Ground checked for services with CAT prior to excavation. 2. Water flow from within the gravels at 1.0m. 3. Trial pit terminated at 2 m below ground level target depth reached. 4. Pit Infilled with arisings to surface.			
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.	.	.	.	.				
					Scale (approx)		Logged By	Figure No.
					1:20		WW	NW149/02.TP02

ARP ARP GEOTECHNICAL LTD CHARTERED CONSULTING ENGINEERS						Site Smithybridge Pub, Littleborough		Trial Pit Number TP03		
Machine : Liebherr Excavator with 1600mm thoothed bucket		Dimensions Top of Pit: 3m x 1.6m Bottom of Pit:: 2.5 mx 1.6m		Ground Level (mOD)		Client Armstrong Projects Ltd		Job Number NW149/02		
Method : Trial Pit		Location		Dates 18/01/2024		Engineer OG		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.40-0.40 0.40-0.40	D J					Firm, medium strength, reddish brown CLAY.				
1.00-1.00	SV 66/20 kN/m2				(2.00)	At 0.5m, firm orangish brown sandy clay lense on north long wall of pit. Sand is fine to coarse. Lense is 0.5m thick and 1m in length.				
						At 0.8m, on long north wall of pit, light brown sandy fine to coarse sub angular to sub rounded GRAVEL of sandstone with medium cobble content. Lense is 0.8m thick and 1m in length.				
					2.00	Complete at 2.00m				
Plan					Remarks					
.					1. Ground checked for services with CAT prior to excavation.					
.					2. Water inflow from gravel lense on side of pit at 1m .					
.					3. Trial pit terminated at 2 m below ground level target depth reached.					
.					4. Pit Infilled with arisings to surface.					
.										
.										
					Scale (approx)		Logged By		Figure No.	
					1:20		WW		NW149/02.TP03	



LABORATORY REPORT



Contract Number: PSL24/0387

Report Date: 22 January 2024
Client's Reference: NW149/02
Client Name: ARP Geotechnical Ltd
Northwest House
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

For the attention of: Owain Gwilym

Contract Title: Smithybridge Pub, Littleborough, Rochdale
Date Received: 16/1/2024
Date Commenced: 16/1/2024
Date Completed: 22/1/2024

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Managing Director)

R Berriman
(Associate Director)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager) (Senior Technical Coordinator)

S Eyre

T Watkins
(Senior Technician)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

Smithybridge Pub, Littleborough, Rochdale

Contract No:

PSL24/0387

Client Ref:

NW149/02

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



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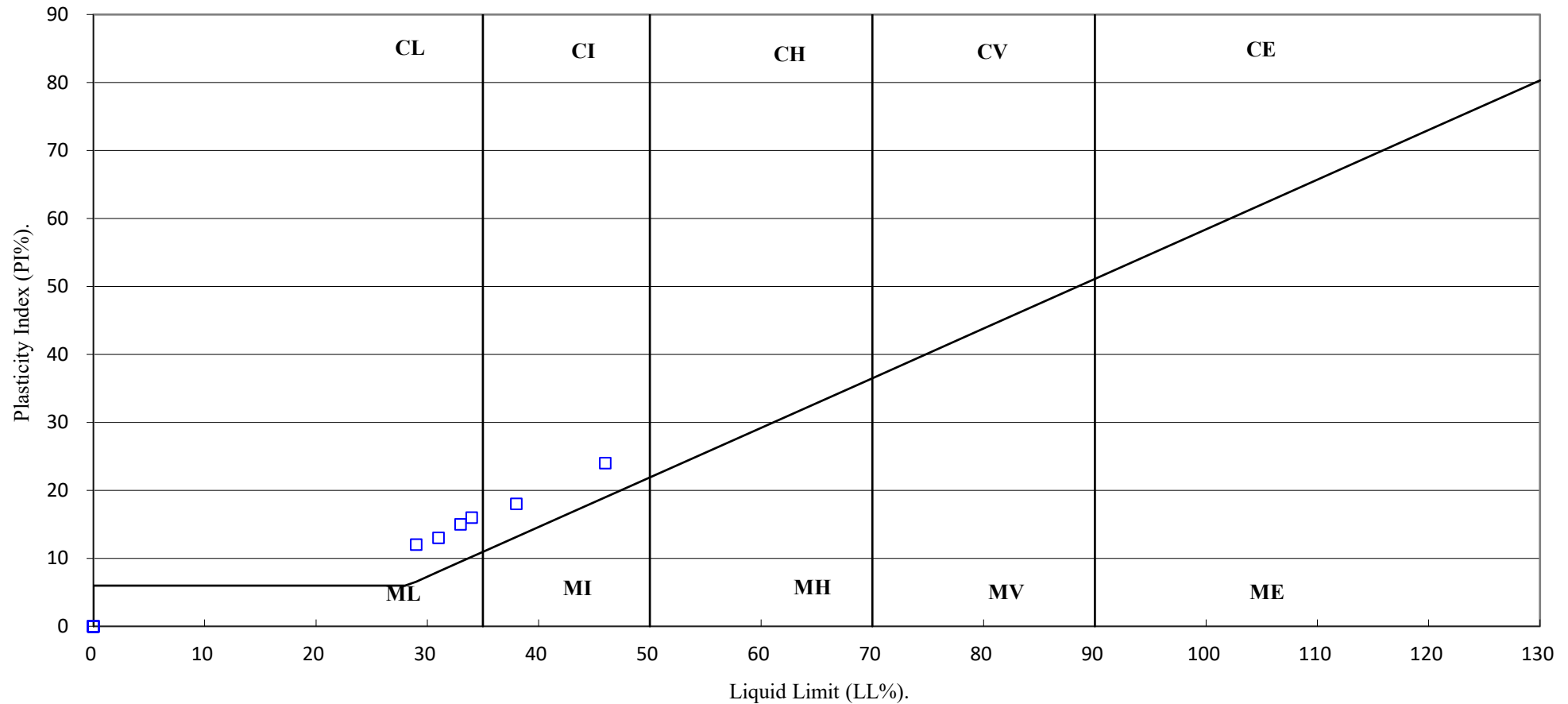
Contract No:

PSL24/0387

Client Ref:

NW149/02

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Smithybridge Pub, Littleborough, Rochdale

Contract No:

PSL24/0387

Client Ref:

NW149/02

PARTICLE SIZE DISTRIBUTION TEST

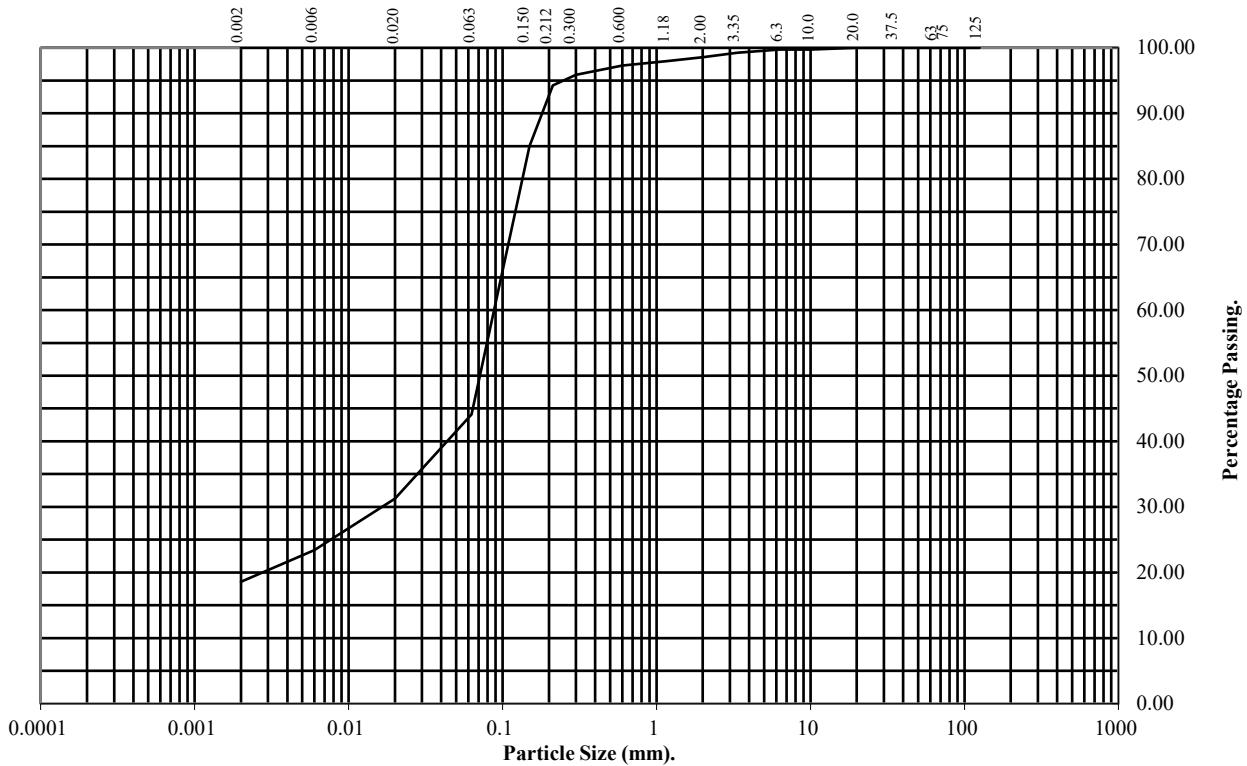
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH1 Top Depth (m): 3.20

Sample Number: 5 Base Depth(m): 4.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	99
1.18	98
0.6	97
0.3	96
0.212	94
0.15	85
0.063	44

Particle Diameter	Percentage Passing
0.02	31
0.006	23
0.002	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	55
Silt	25
Clay	19

Remarks:

See Summary of Soil Descriptions



Smithybridge Pub, Littleborough, Rochdale

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NW149/02

PARTICLE SIZE DISTRIBUTION TEST

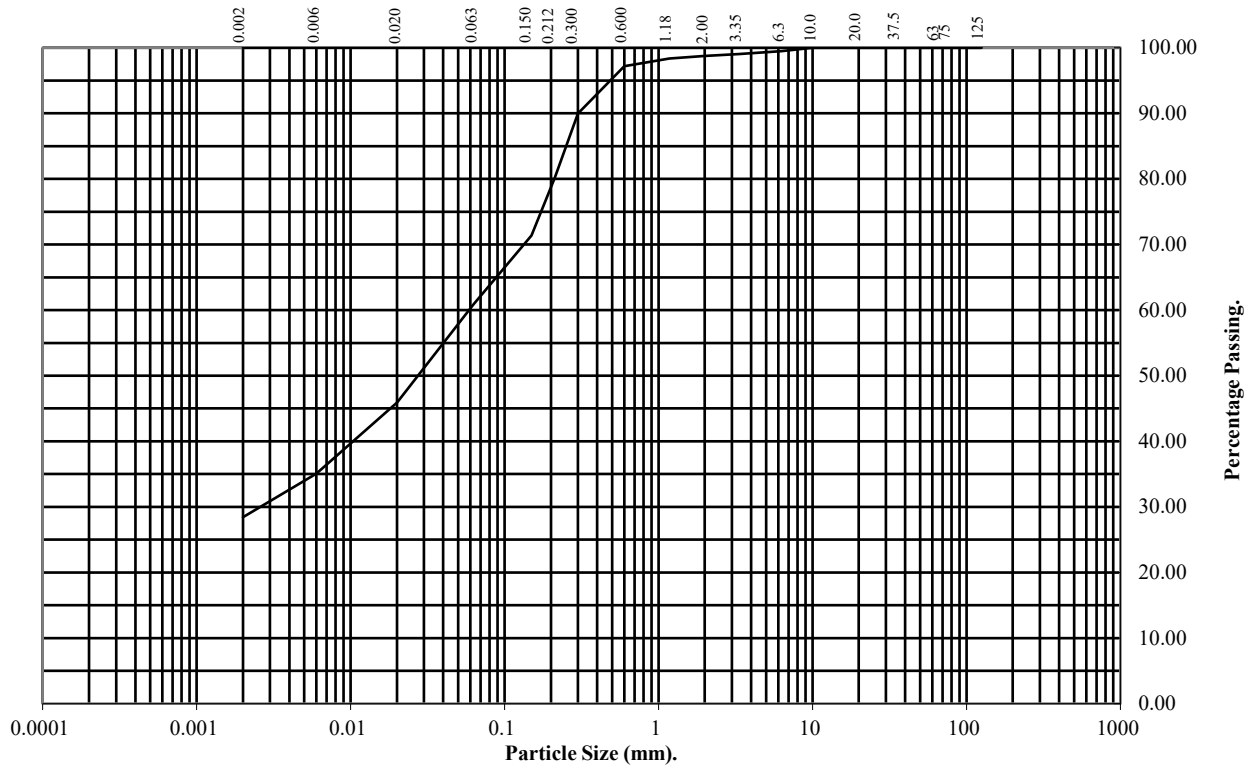
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH2 Top Depth (m): 7.00

Sample Number: 10 Base Depth(m): 8.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	99
1.18	98
0.6	97
0.3	90
0.212	80
0.15	71
0.063	61

Particle Diameter	Percentage Passing
0.02	46
0.006	35
0.002	28

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	38
Silt	33
Clay	28

Remarks:

See Summary of Soil Descriptions



Smithybridge Pub, Littleborough, Rochdale

Contract No:
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PARTICLE SIZE DISTRIBUTION TEST

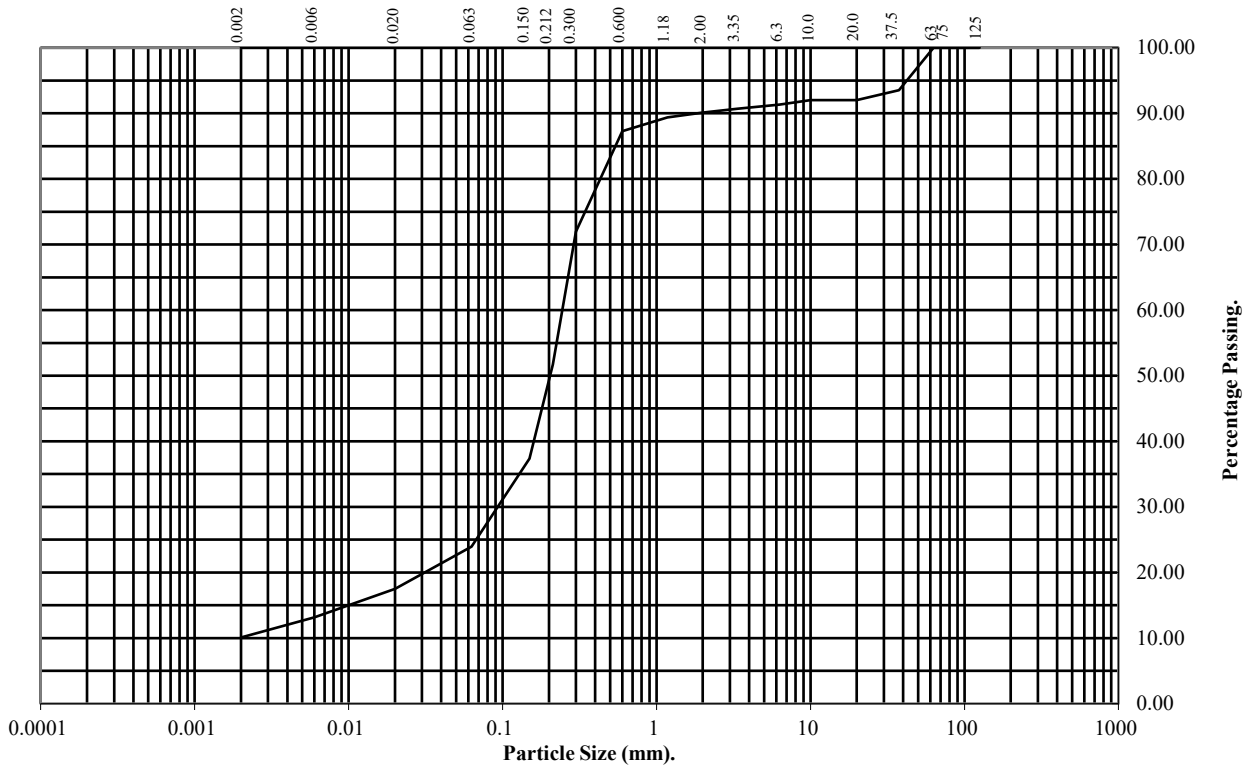
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH2 Top Depth (m): 8.00

Sample Number: 12 Base Depth(m): 9.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	94
20	92
10	92
6.3	91
3.35	91
2	90
1.18	89
0.6	87
0.3	72
0.212	52
0.15	37
0.063	24

Particle Diameter	Percentage Passing
0.02	18
0.006	13
0.002	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	10
Sand	66
Silt	14
Clay	10

Remarks:

See Summary of Soil Descriptions



Smithybridge Pub, Littleborough, Rochdale

Contract No:
PSL24/0387
Client Ref:
NW149/02



4161



7 - 11 Harding Street
Leicester
LE1 4DH

Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster
DN4 0AR

Analytical Test Report: L24/00509/PSL - 24-40950

Your Project Reference:	PSL24/0387 Smithybridge Pub, Littleborough, Rochdale		
Your Order Number:	PSL24/0387	Samples Received / Instructed:	22/01/2024 / 22/01/2024
Report Issue Number:	1	Sample Tested:	22/01 to 25/01/2024
Samples Analysed:	2 soil samples	Report issued:	25/01/2024

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 30.10.2023

Issued by: J. Gane

Issue No: 4

Rev No: 5



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7 - 11 Harding Street
Leicester
LE1 4DH

L24/00509/PSL - 24-40950

Project Reference - PSL24/0387 Smithybridge Pub,
Littleborough, Rochdale

Analytical Test Results - Chemical Analysis

Lab Reference			336957	336958
Client Sample ID			-	-
Client Sample Location			BH1	BH2
Client Sample Type			D	D
Client Sample Number			D10	D20
Depth - Top (m)			7.50	14.00
Depth - Bottom (m)			7.50	14.40
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Clay
Determinant	Units	Accreditation		
Water soluble sulphate (as SO ₄)	(mg/l)	u	50	20
pH Value	pH Units	MCERTS	6.9	8.1



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L24/00509/PSL - 24-40950

Project Reference - PSL24/0387 Smithybridge Pub, Littleborough, Rochdale

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
336957	-	BH1	D	D10	Brown slightly gravelly sandy silty clay	-	-	59
336958	-	BH2	D	D20	Brown slightly gravelly sandy silty clay	-	-	69



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LE1 4DH

L24/00509/PSL - 24-40950

Project Reference - PSL24/0387 Smithybridge Pub, Littleborough, Rochdale

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
336957	-	BH1	D	D10	
336958	-	BH2	D	D20	



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L24/00509/PSL - 24-40950

Project Reference - PSL24/0387 Smithybridge Pub, Littleborough, Rochdale

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis



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L24/00509/PSL - 24-40950

Project Reference - PSL24/0387 Smithybridge Pub, Littleborough, Rochdale

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
336957	-	BH1	D	D10		A
336958	-	BH2	D	D20		A