MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	01-Sep-22	**JOB NUMBER**	MRN 4454/46
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C16 L2	225	1.83	1.58	16	95.0	4.6
2	C18 L2	225	1.86	1.60	17	96.1	2.6
3	C20 L2	225	1.84	1.59	16	95.7	4.3
4	C15 L2	225	1.86	1.58	17	95.3	2.3
5	C14 L5	225	1.85	1.59	17	95.8	3.1
6	C10 L8	225	1.87	1.60	17	96.6	2.3
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
					Particle Density (Mg/m3)	2.25	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	01-Sep-22	**JOB NUMBER**	MRN 4454/46
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D16 L2	225	1.82	1.53	19	94.9	7.9
2	D17 L2	225	1.86	1.57	18	97.6	7.0
3	C17 L2	225	1.85	1.54	20	96.0	6.2
4	D18 L2	225	1.88	1.56	21	96.9	3.7
5	D19 L2	225	1.84	1.55	19	96.1	7.8
6	D20 L2	225	1.88	1.57	20	97.7	4.8
7	C19 L2	225	1.87	1.53	22	95.0	3.3
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14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.61	(Advised by client)	
				Particle Density (Mg/m3)	2.44	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/46			
TEST LOCATION	Test 01 - C12 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	01-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4595	4581	4540	4572	0.00	0.00	0.0
4443	4449	4387	4426	-1.46	20.00	70.7
4505	4492	4411	4469	-1.03	0.00	0.0
4479	4470	4376	4442	-1.30	9.00	31.8
4453	4443	4344	4413	-1.59	14.00	49.5
4424	4411	4310	4382	-1.90	21.00	74.3
4394	4386	4277	4352	-2.20	25.00	88.4
4368	4363	4246	4326	-2.46	29.00	102.6
4337	4337	4218	4297	-2.75	35.00	123.8
4454	4444	4355	4418	-1.54	0.00	0.0
4415	4404	4316	4378	-1.94	10.00	35.4
4386	4379	4290	4352	-2.20	18.00	63.7
4379	4363	4282	4341	-2.31	20.00	70.7
4344	4339	4220	4301	-2.71	30.00	106.1
4304	4301	4200	4268	-3.04	37.00	130.9
4273	4276	4162	4237	-3.35	40.00	141.5
4421	4399	4314	4378	-1.94	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	93	kPa
Modulus of subgrade reaction (k) =	74	MPa/m
Equivalent 762 mm plate reaction =	60	MPa/m
Equivalent CBR =	11.5	%
Surface Stiffness Modulus (E) =	84	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	112	kPa
Modulus of subgrade reaction (k) =	90	MPa/m
Equivalent 762 mm plate reaction =	72	MPa/m
Equivalent CBR =	16.1	%
Surface Stiffness Modulus (E) =	104	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

DATE 02-Sep-22

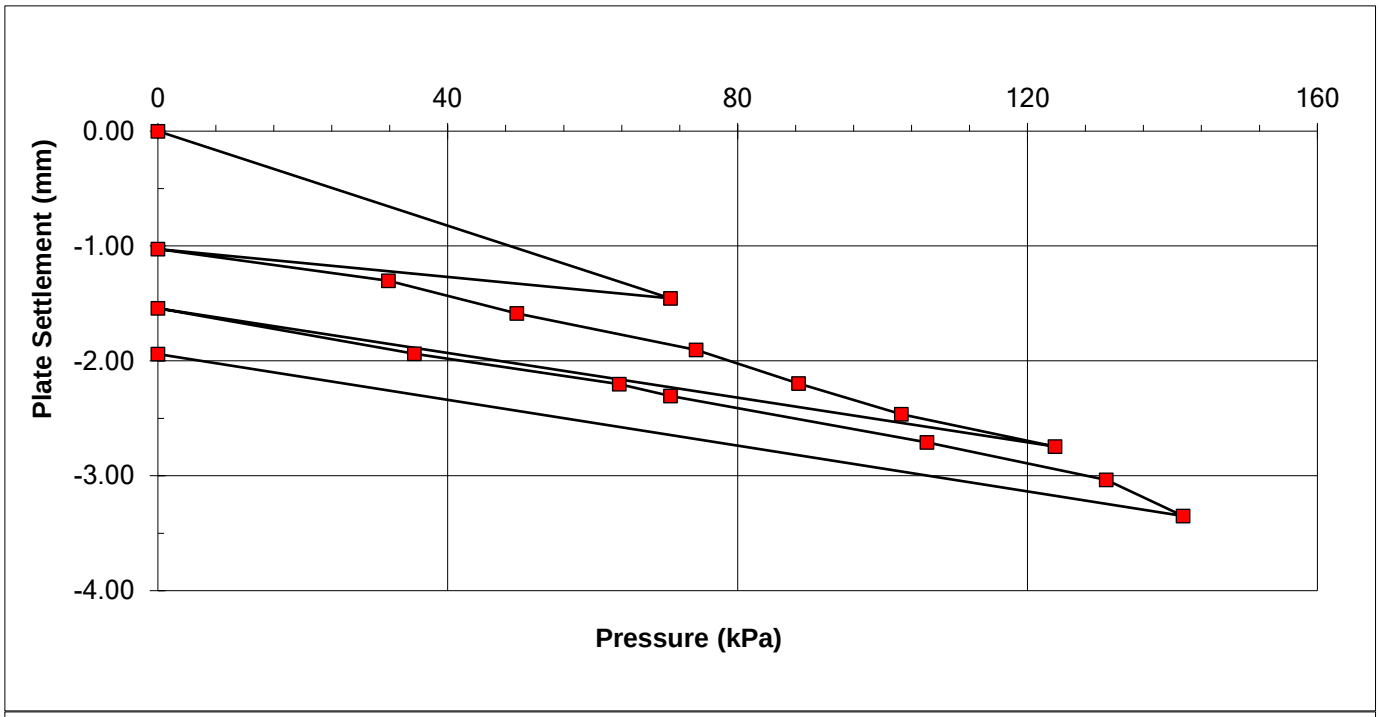
MURRAY RIX

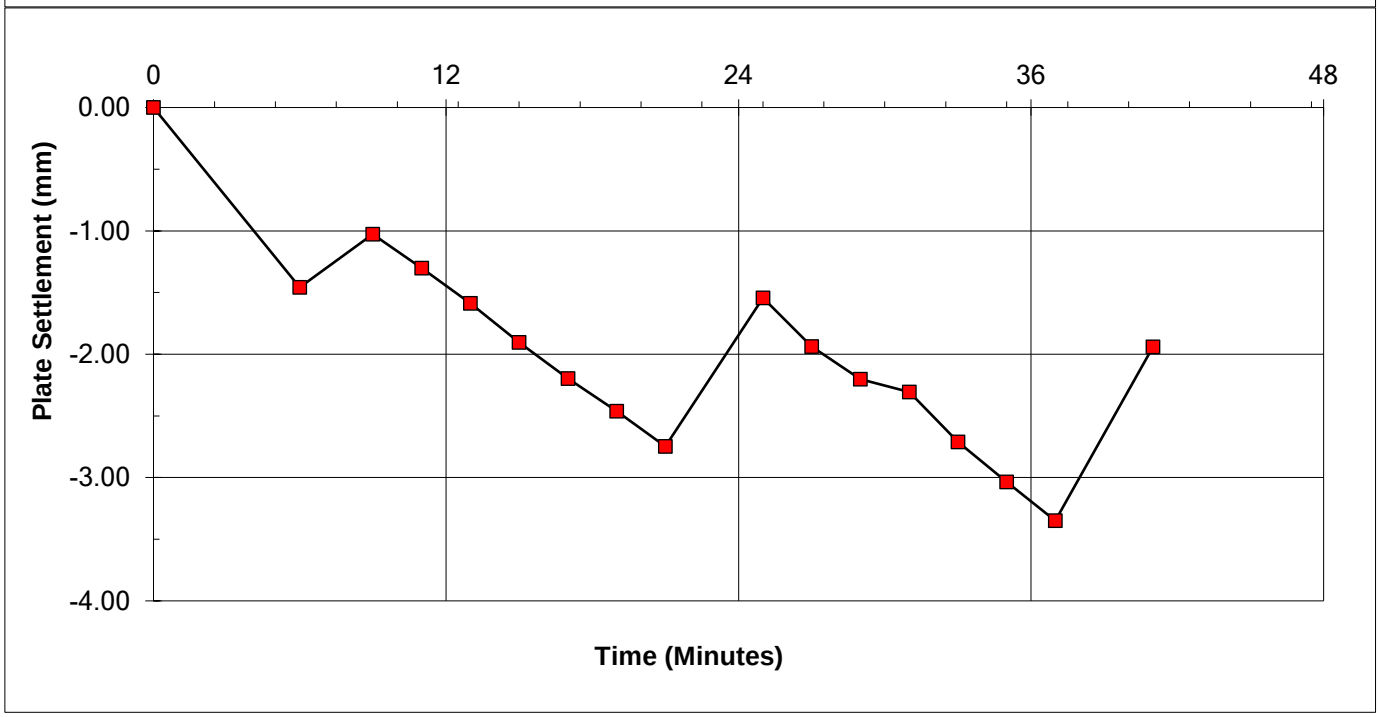
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/46			
TEST LOCATION	Test 02 - E12 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	01-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4548	4575	4603	4575	0.00	0.00	0.0
4396	4445	4427	4423	-1.53	12.00	42.4
4423	4474	4438	4445	-1.30	0.00	0.0
4395	4446	4415	4419	-1.57	11.00	38.9
4369	4421	4386	4392	-1.83	19.00	67.2
4343	4388	4356	4362	-2.13	24.00	84.9
4317	4357	4328	4334	-2.41	31.00	109.6
4288	4327	4292	4302	-2.73	40.00	141.5
4253	4288	4251	4264	-3.11	49.00	173.3
4323	4359	4320	4334	-2.41	0.00	0.0
4296	4333	4295	4308	-2.67	17.00	60.1
4268	4311	4263	4281	-2.95	40.00	141.5
4242	4288	4239	4256	-3.19	52.00	183.9
4216	4265	4210	4230	-3.45	65.00	229.9
4188	4234	4179	4200	-3.75	79.00	279.4
4157	4210	4146	4171	-4.04	93.00	328.9
4237	4291	4188	4239	-3.37	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	124	kPa
Modulus of subgrade reaction (k) =	99	MPa/m
Equivalent 762 mm plate reaction =	80	MPa/m
Equivalent CBR =	19.0	%
Surface Stiffness Modulus (E) =	116	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	265	kPa
Modulus of subgrade reaction (k) =	212	MPa/m
Equivalent 762 mm plate reaction =	171	MPa/m
Equivalent CBR =	71.2	%
Surface Stiffness Modulus (E) =	270	MN/m^2

Surface Stiffness Modulus Ratio =	2.3

DATE 02-Sep-22

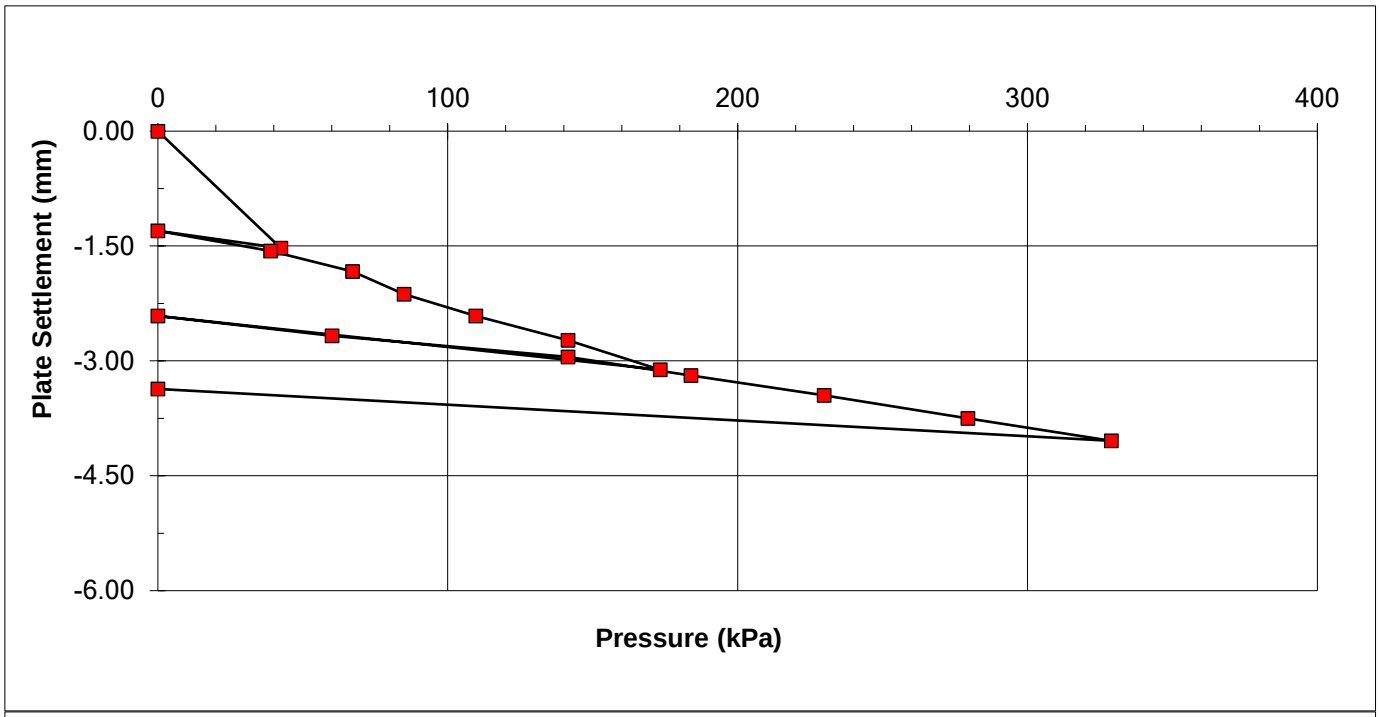
MURRAY RIX

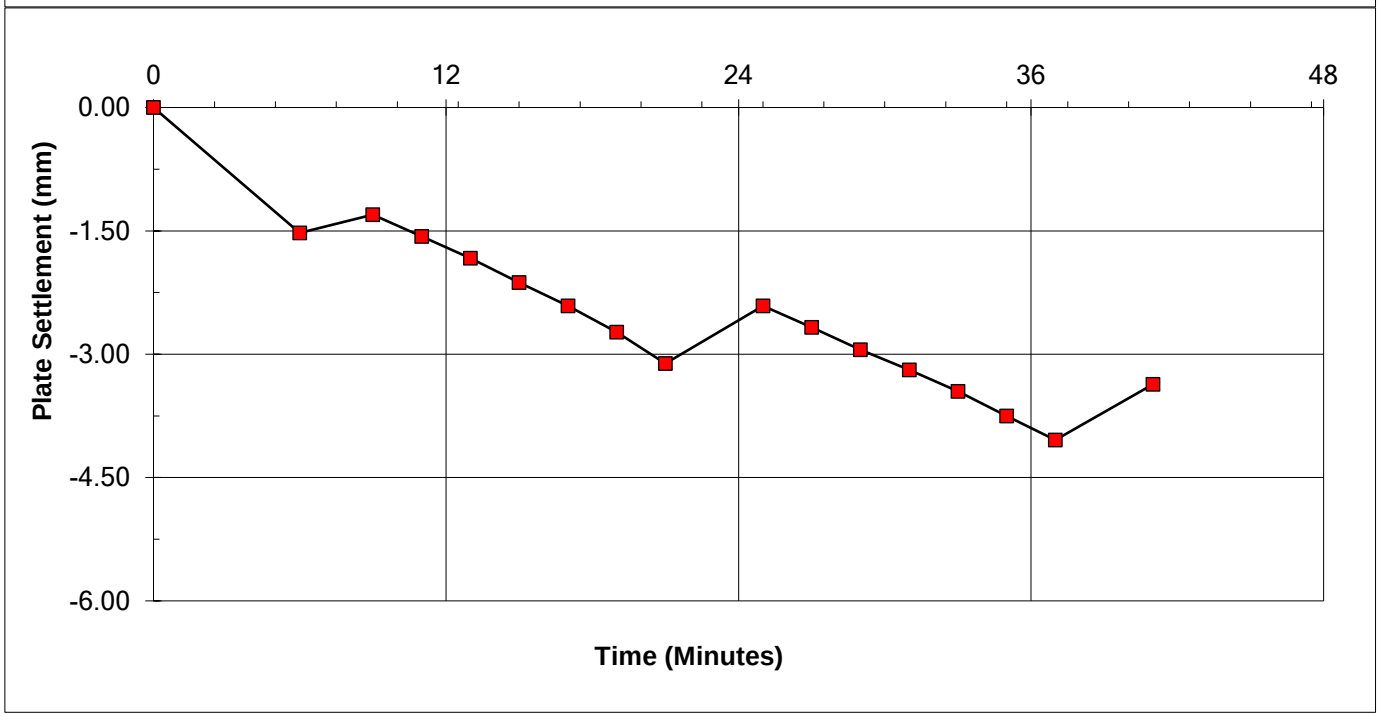
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/46

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	01/09/2022
DATE OF TEST	01/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	02/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116229	SRD C18 L2	Black Ash/Sand	1.88	1.61	17	97.0	1.1
116230	SRD C16 L2	Black Ash/Sand	1.89	1.63	16	98.2	1.5
116231	SRD C20 L2	Black Ash/Sand	1.86	1.59	17	95.8	2.3
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/46A
Date of Issue 02 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

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TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	01-Sep-22	**JOB NUMBER**	MRN 4454/46A
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C16 L2	225	1.83	1.58	16	95.0	4.6
2	C18 L2	225	1.86	1.60	17	96.1	2.6
3	C20 L2	225	1.84	1.59	16	95.7	4.3
4	C15 L2	225	1.86	1.58	17	95.3	2.3
5	C14 L5	225	1.85	1.59	17	95.8	3.1
6	C10 L8	225	1.87	1.60	17	96.6	2.3
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17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
					Particle Density (Mg/m3)	2.25	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX

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TEST CERTIFICATE

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BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	01-Sep-22	**JOB NUMBER**	MRN 4454/46A
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D16 L2	225	1.82	1.53	19	94.9	7.9
2	D17 L2	225	1.86	1.57	18	97.6	7.0
3	C17 L2	225	1.85	1.54	20	96.0	6.2
4	D18 L2	225	1.88	1.56	21	96.9	3.7
5	D19 L2	225	1.84	1.55	19	96.1	7.8
6	D20 L2	225	1.88	1.57	20	97.7	4.8
7	C19 L2	225	1.87	1.53	22	95.0	3.3
8							
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16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.61	(Advised by client)	
				Particle Density (Mg/m3)	2.44	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX

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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/46A			
TEST LOCATION	Test 01 - C12 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	01-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4595	4581	4540	4572	0.00	0.00	0.0
4443	4449	4387	4426	-1.46	20.00	70.7
4505	4492	4411	4469	-1.03	0.00	0.0
4479	4470	4376	4442	-1.30	9.00	31.8
4453	4443	4344	4413	-1.59	14.00	49.5
4424	4411	4310	4382	-1.90	21.00	74.3
4394	4386	4277	4352	-2.20	25.00	88.4
4368	4363	4246	4326	-2.46	29.00	102.6
4337	4337	4218	4297	-2.75	35.00	123.8
4454	4444	4355	4418	-1.54	0.00	0.0
4415	4404	4316	4378	-1.94	10.00	35.4
4386	4379	4290	4352	-2.20	18.00	63.7
4379	4363	4282	4341	-2.31	20.00	70.7
4344	4339	4220	4301	-2.71	30.00	106.1
4304	4301	4200	4268	-3.04	37.00	130.9
4273	4276	4162	4237	-3.35	40.00	141.5
4421	4399	4314	4378	-1.94	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	93	kPa
Modulus of subgrade reaction (k) =	74	MPa/m
Equivalent 762 mm plate reaction =	60	MPa/m
Equivalent CBR =	11.5	%
Surface Stiffness Modulus (E) =	84	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	112	kPa
Modulus of subgrade reaction (k) =	90	MPa/m
Equivalent 762 mm plate reaction =	72	MPa/m
Equivalent CBR =	16.1	%
Surface Stiffness Modulus (E) =	104	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

DATE 02-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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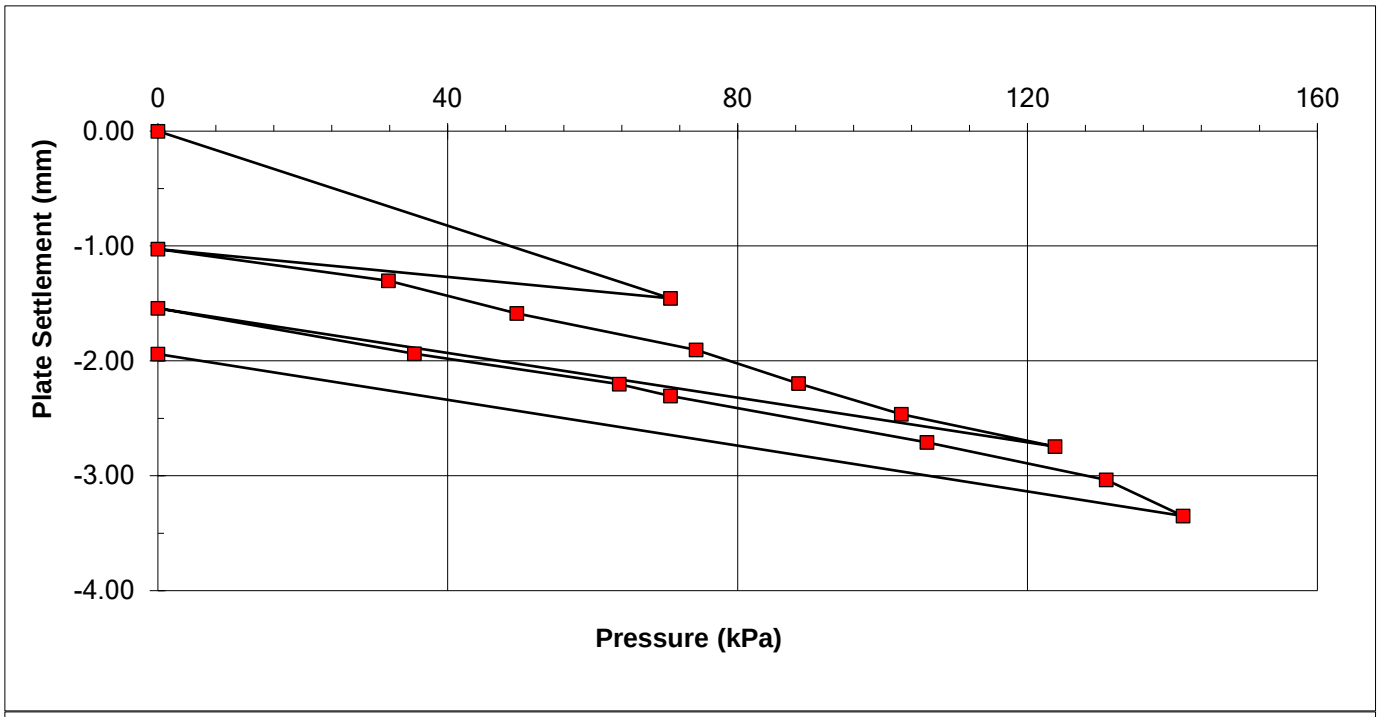
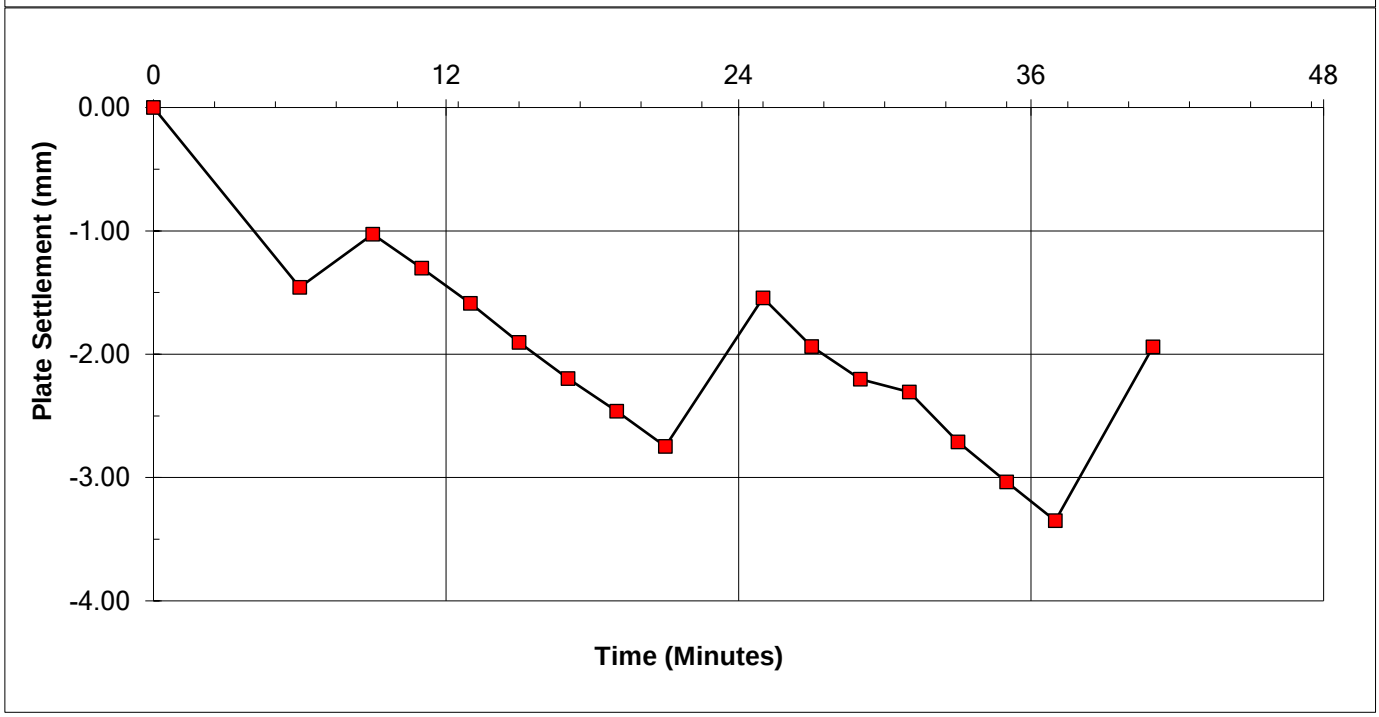
TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02-Sep-22

MURRAY RIX

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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/46A			
TEST LOCATION	Test 02 - D12 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	01-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4548	4575	4603	4575	0.00	0.00	0.0
4396	4445	4427	4423	-1.53	12.00	42.4
4423	4474	4438	4445	-1.30	0.00	0.0
4395	4446	4415	4419	-1.57	11.00	38.9
4369	4421	4386	4392	-1.83	19.00	67.2
4343	4388	4356	4362	-2.13	24.00	84.9
4317	4357	4328	4334	-2.41	31.00	109.6
4288	4327	4292	4302	-2.73	40.00	141.5
4253	4288	4251	4264	-3.11	49.00	173.3
4323	4359	4320	4334	-2.41	0.00	0.0
4296	4333	4295	4308	-2.67	17.00	60.1
4268	4311	4263	4281	-2.95	40.00	141.5
4242	4288	4239	4256	-3.19	52.00	183.9
4216	4265	4210	4230	-3.45	65.00	229.9
4188	4234	4179	4200	-3.75	79.00	279.4
4157	4210	4146	4171	-4.04	93.00	328.9
4237	4291	4188	4239	-3.37	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	124	kPa
Modulus of subgrade reaction (k) =	99	MPa/m
Equivalent 762 mm plate reaction =	80	MPa/m
Equivalent CBR =	19.0	%
Surface Stiffness Modulus (E) =	116	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	265	kPa
Modulus of subgrade reaction (k) =	212	MPa/m
Equivalent 762 mm plate reaction =	171	MPa/m
Equivalent CBR =	71.2	%
Surface Stiffness Modulus (E) =	270	MN/m^2

Surface Stiffness Modulus Ratio =	2.3

DATE 02-Sep-22

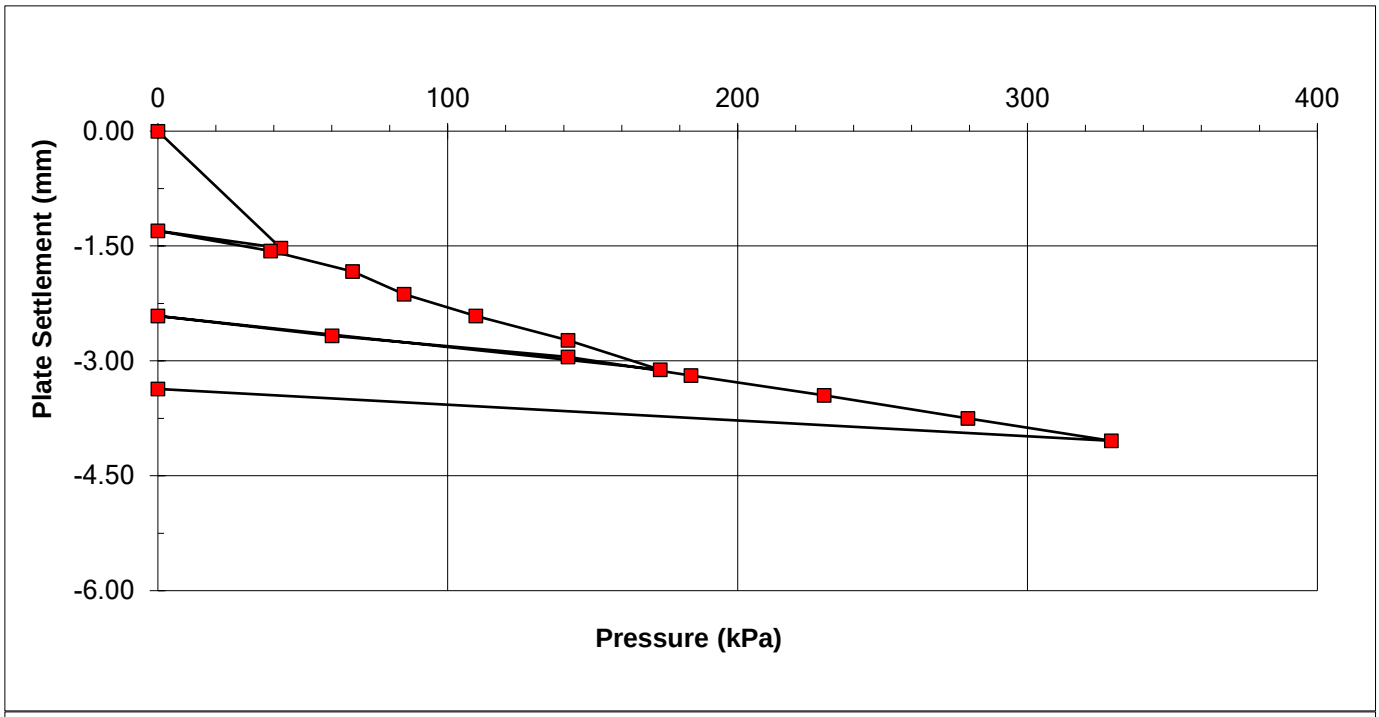
MURRAY RIX

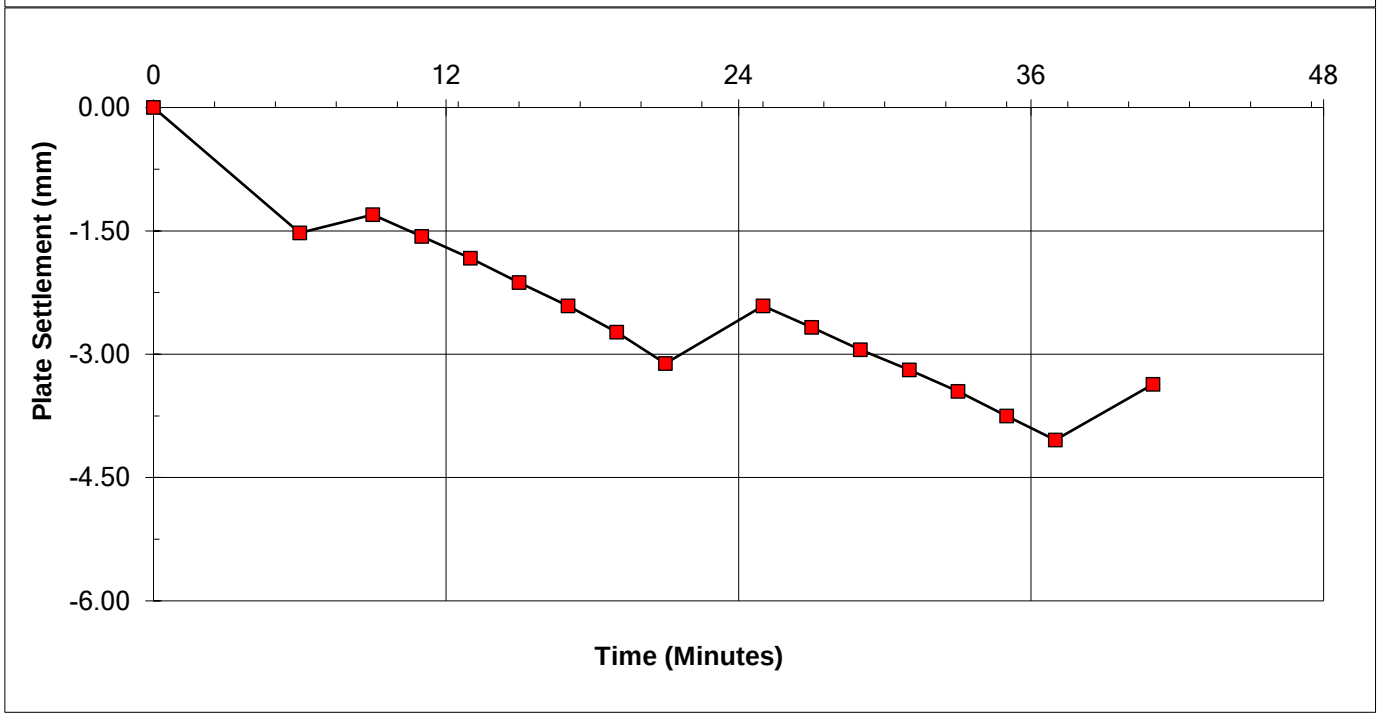
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 02-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/46A

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	01/09/2022
DATE OF TEST	01/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	02/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116229	SRD C18 L2	Black Ash/Sand	1.88	1.61	17	97.0	1.1
116230	SRD C16 L2	Black Ash/Sand	1.89	1.63	16	98.2	1.5
116231	SRD C20 L2	Black Ash/Sand	1.86	1.59	17	95.8	2.3
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 02-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/47
Date of Issue 05 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/47			
TEST LOCATION	Test 01 - F12 L7	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	02-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4710	4691	4713	4705	0.00	0.00	0.0
4553	4556	4542	4550	-1.54	61.00	215.7
4614	4611	4554	4593	-1.12	0.00	0.0
4588	4584	4528	4567	-1.38	20.00	70.7
4560	4562	4503	4542	-1.63	49.00	173.3
4527	4538	4470	4512	-1.93	80.00	282.9
4500	4505	4435	4480	-2.25	96.00	339.5
4479	4483	4398	4453	-2.51	106.00	374.9
4450	4455	4369	4425	-2.80	114.00	403.2
4570	4538	4571	4560	-1.45	0.00	0.0
4542	4517	4549	4536	-1.69	10.00	35.4
4518	4491	4526	4512	-1.93	40.00	141.5
4492	4468	4505	4488	-2.16	60.00	212.2
4460	4448	4479	4462	-2.42	80.00	282.9
4433	4423	4450	4435	-2.69	102.00	360.8
4412	4401	4423	4412	-2.93	120.00	424.4
4521	4452	4526	4500	-2.05	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	355	kPa
Modulus of subgrade reaction (k) =	284	MPa/m
Equivalent 762 mm plate reaction =	229	MPa/m
Equivalent CBR =	118.3	%
Surface Stiffness Modulus (E) =	373	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	363	kPa
Modulus of subgrade reaction (k) =	290	MPa/m
Equivalent 762 mm plate reaction =	233	MPa/m
Equivalent CBR =	122.5	%
Surface Stiffness Modulus (E) =	382	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 05-Sep-22

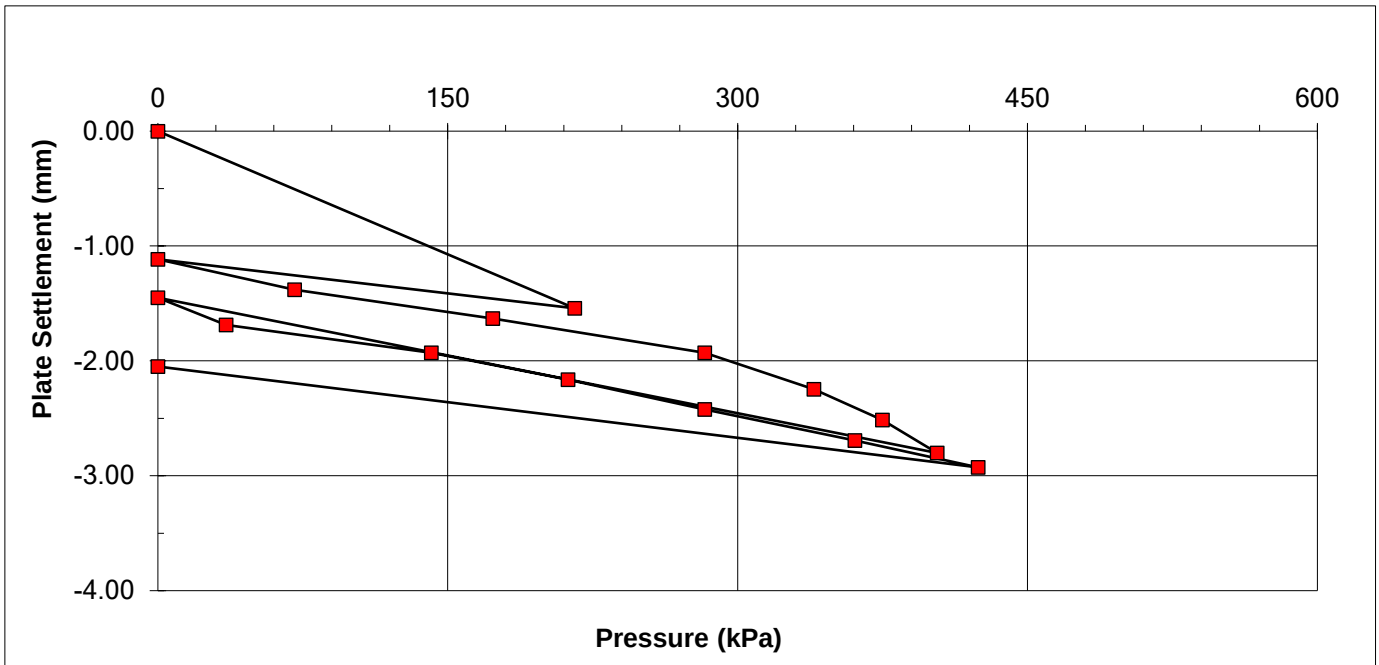
MURRAY RIX

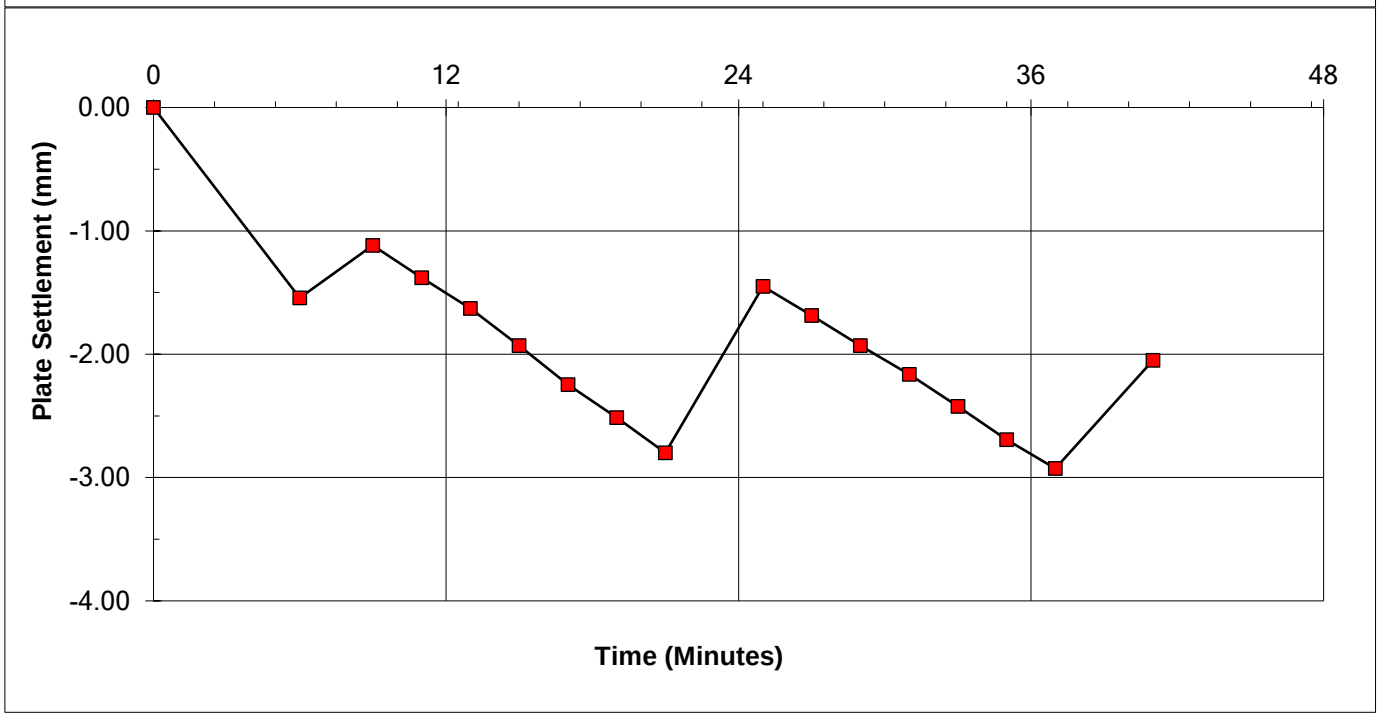
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 05-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/47			
TEST LOCATION	Test 02 - D9 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	02-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4581	4610	4671	4621	0.00	0.00	0.0
4429	4482	4531	4481	-1.40	13.00	46.0
4451	4490	4566	4502	-1.18	0.00	0.0
4422	4462	4535	4473	-1.48	9.00	31.8
4388	4431	4508	4442	-1.78	16.00	56.6
4358	4405	4477	4413	-2.07	20.00	70.7
4327	4379	4445	4384	-2.37	24.00	84.9
4295	4352	4410	4352	-2.68	30.00	106.1
4254	4307	4378	4313	-3.08	34.00	120.3
4321	4367	4454	4381	-2.40	0.00	0.0
4275	4221	4287	4261	-3.60	44.00	155.6
4232	4187	4242	4220	-4.00	51.00	180.4
4198	4157	4210	4188	-4.32	59.00	208.7
4145	4113	4171	4143	-4.78	66.00	233.4
4103	4074	4127	4101	-5.19	78.00	275.9
4060	4037	4092	4063	-5.58	84.00	297.1
4190	4124	4231	4182	-4.39	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	89	kPa
Modulus of subgrade reaction (k) =	71	MPa/m
Equivalent 762 mm plate reaction =	57	MPa/m
Equivalent CBR =	10.8	%
Surface Stiffness Modulus (E) =	81	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	159	kPa
Modulus of subgrade reaction (k) =	127	MPa/m
Equivalent 762 mm plate reaction =	102	MPa/m
Equivalent CBR =	29.3	%
Surface Stiffness Modulus (E) =	153	MN/m^2

Surface Stiffness Modulus Ratio =	1.9

DATE 05-Sep-22

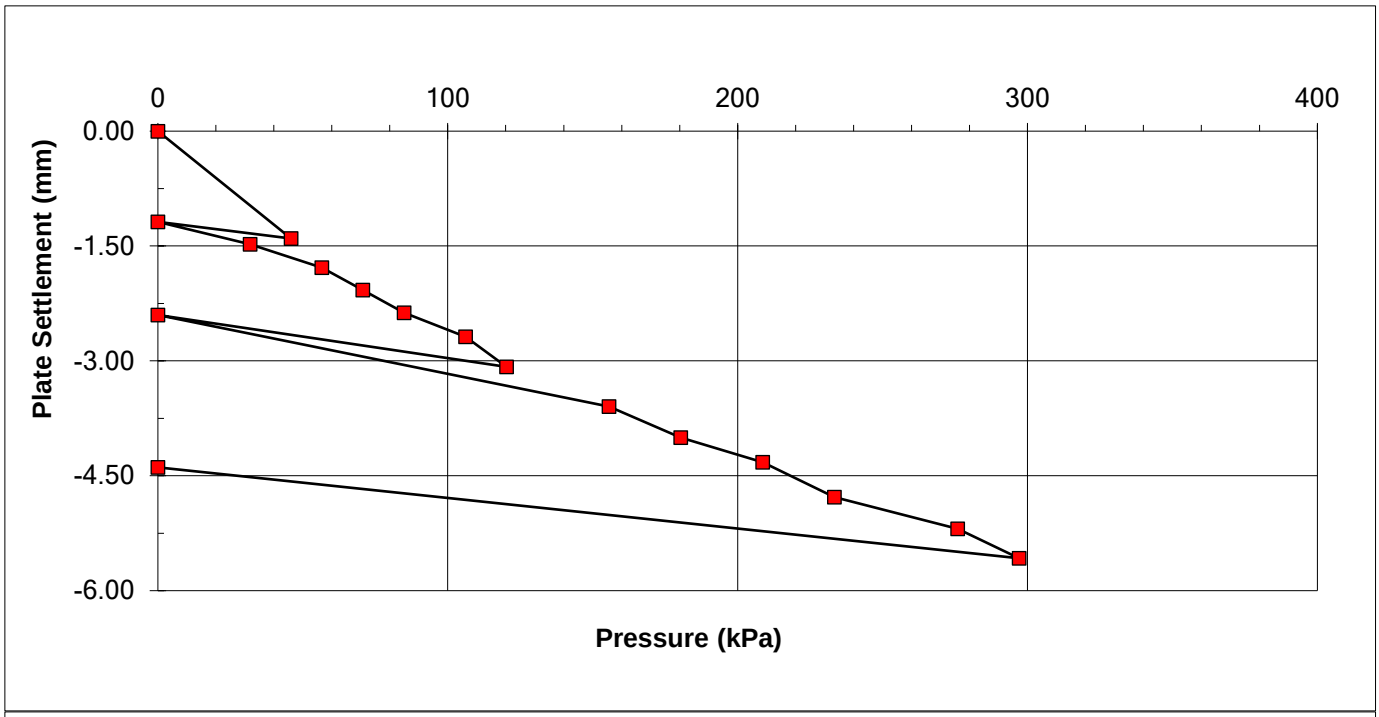
MURRAY RIX

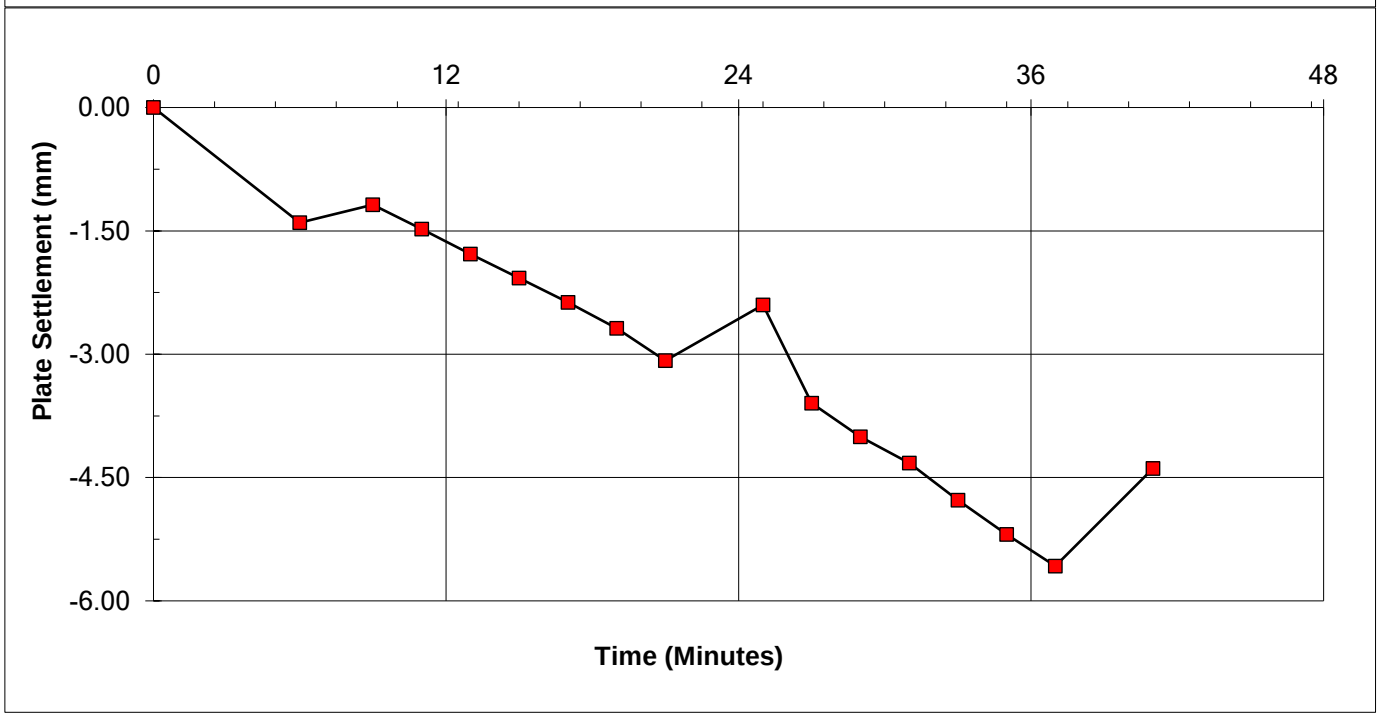
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 05-Sep-22

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/47A
Date of Issue 05 September 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/47A			
TEST LOCATION	Test 01 - F12 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	02-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4710	4691	4713	4705	0.00	0.00	0.0
4553	4556	4542	4550	-1.54	61.00	215.7
4614	4611	4554	4593	-1.12	0.00	0.0
4588	4584	4528	4567	-1.38	20.00	70.7
4560	4562	4503	4542	-1.63	49.00	173.3
4527	4538	4470	4512	-1.93	80.00	282.9
4500	4505	4435	4480	-2.25	96.00	339.5
4479	4483	4398	4453	-2.51	106.00	374.9
4450	4455	4369	4425	-2.80	114.00	403.2
4570	4538	4571	4560	-1.45	0.00	0.0
4542	4517	4549	4536	-1.69	10.00	35.4
4518	4491	4526	4512	-1.93	40.00	141.5
4492	4468	4505	4488	-2.16	60.00	212.2
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4433	4423	4450	4435	-2.69	102.00	360.8
4412	4401	4423	4412	-2.93	120.00	424.4
4521	4452	4526	4500	-2.05	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	355	kPa
Modulus of subgrade reaction (k) =	284	MPa/m
Equivalent 762 mm plate reaction =	229	MPa/m
Equivalent CBR =	118.3	%
Surface Stiffness Modulus (E) =	373	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	363	kPa
Modulus of subgrade reaction (k) =	290	MPa/m
Equivalent 762 mm plate reaction =	233	MPa/m
Equivalent CBR =	122.5	%
Surface Stiffness Modulus (E) =	382	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 05-Sep-22

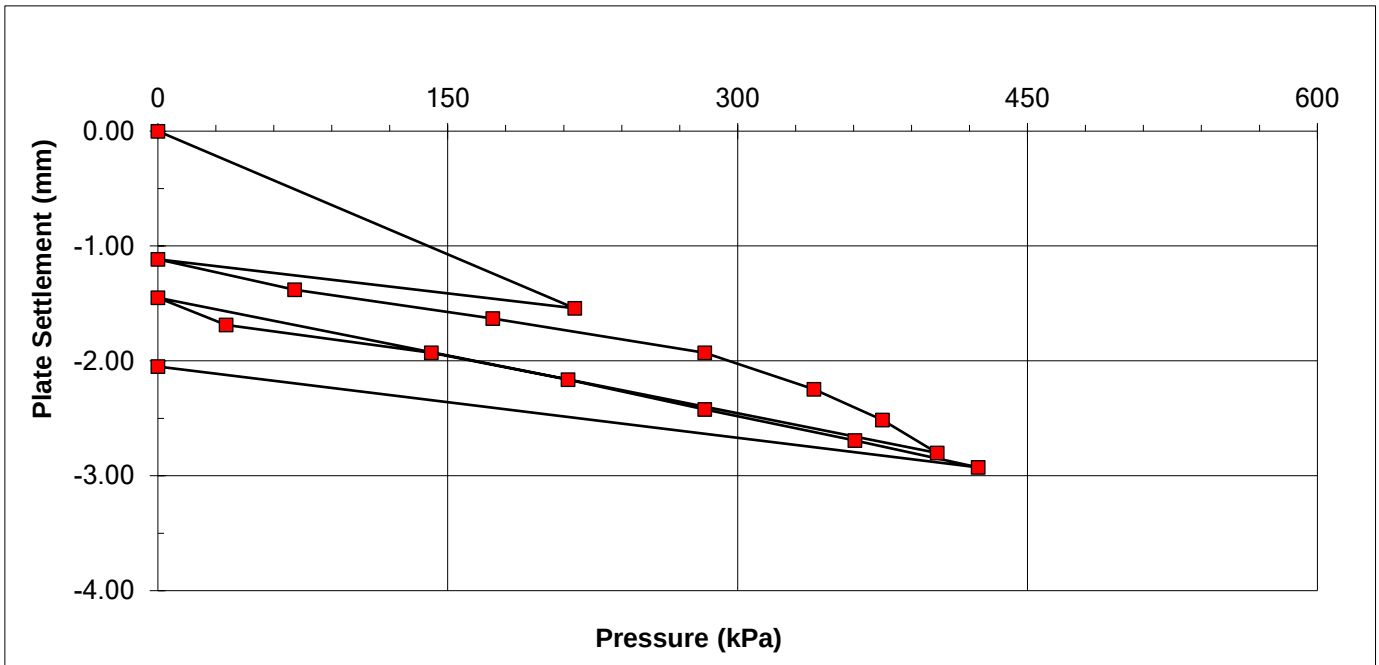
MURRAY RIX

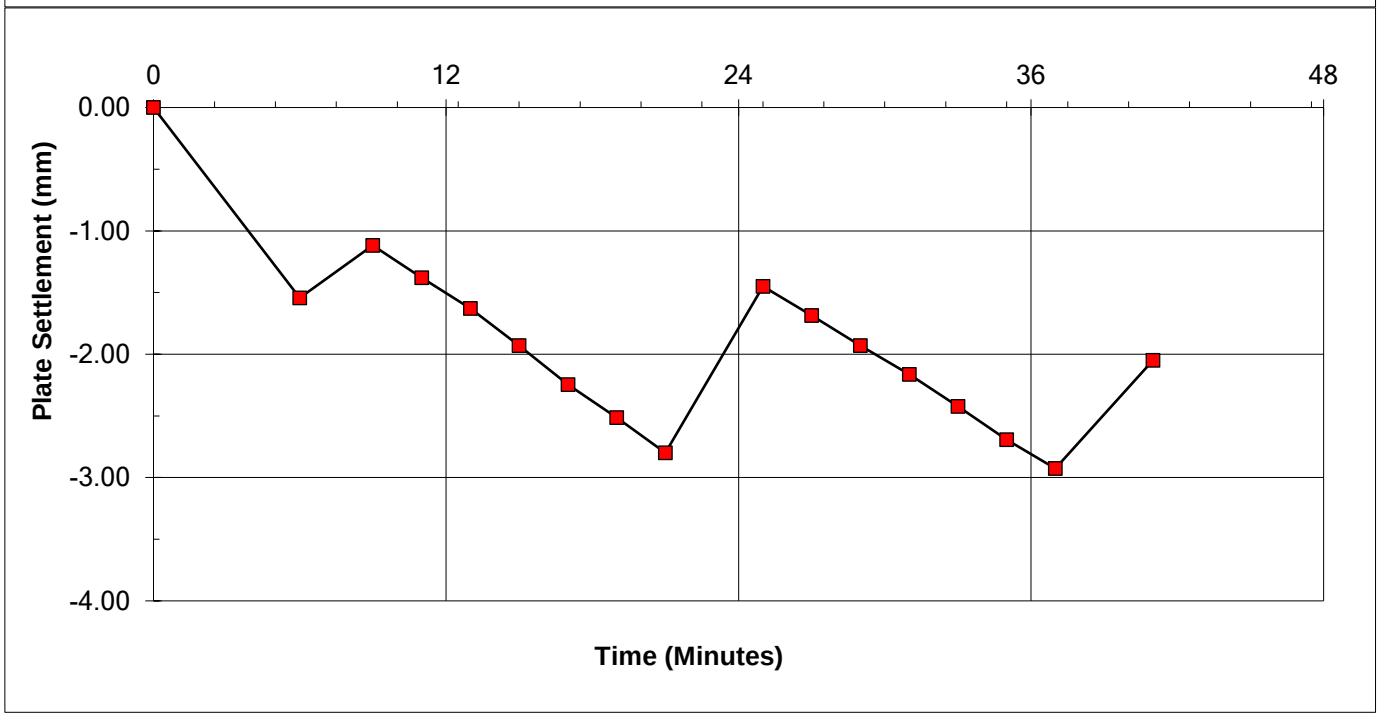
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 05-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/47A			
TEST LOCATION	Test 02 - D9 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	02-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4581	4610	4671	4621	0.00	0.00	0.0
4429	4482	4531	4481	-1.40	13.00	46.0
4451	4490	4566	4502	-1.18	0.00	0.0
4422	4462	4535	4473	-1.48	9.00	31.8
4388	4431	4508	4442	-1.78	16.00	56.6
4358	4405	4477	4413	-2.07	20.00	70.7
4327	4379	4445	4384	-2.37	24.00	84.9
4295	4352	4410	4352	-2.68	30.00	106.1
4254	4307	4378	4313	-3.08	34.00	120.3
4321	4367	4454	4381	-2.40	0.00	0.0
4275	4221	4287	4261	-3.60	44.00	155.6
4232	4187	4242	4220	-4.00	51.00	180.4
4198	4157	4210	4188	-4.32	59.00	208.7
4145	4113	4171	4143	-4.78	66.00	233.4
4103	4074	4127	4101	-5.19	78.00	275.9
4060	4037	4092	4063	-5.58	84.00	297.1
4190	4124	4231	4182	-4.39	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	89	kPa
Modulus of subgrade reaction (k) =	71	MPa/m
Equivalent 762 mm plate reaction =	57	MPa/m
Equivalent CBR =	10.8	%
Surface Stiffness Modulus (E) =	81	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	159	kPa
Modulus of subgrade reaction (k) =	127	MPa/m
Equivalent 762 mm plate reaction =	102	MPa/m
Equivalent CBR =	29.3	%
Surface Stiffness Modulus (E) =	153	MN/m^2

Surface Stiffness Modulus Ratio =	1.9

DATE 05-Sep-22

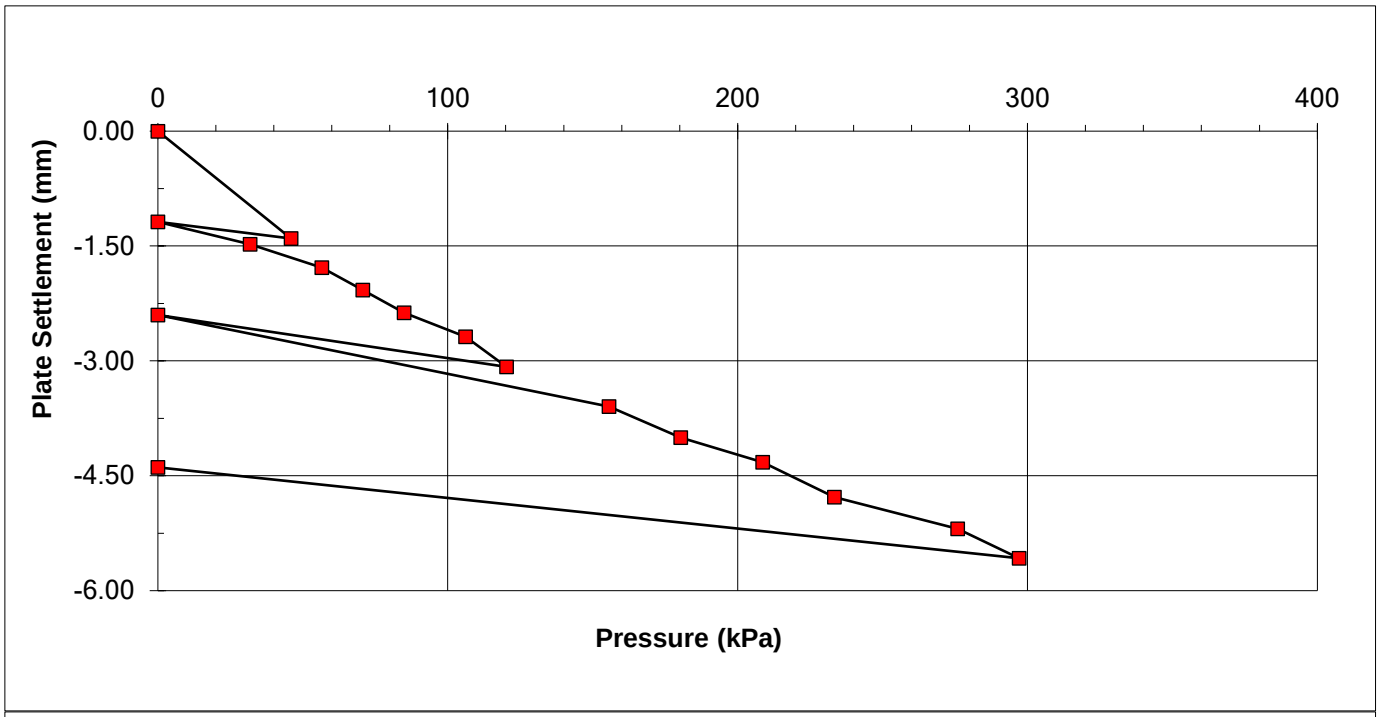
MURRAY RIX

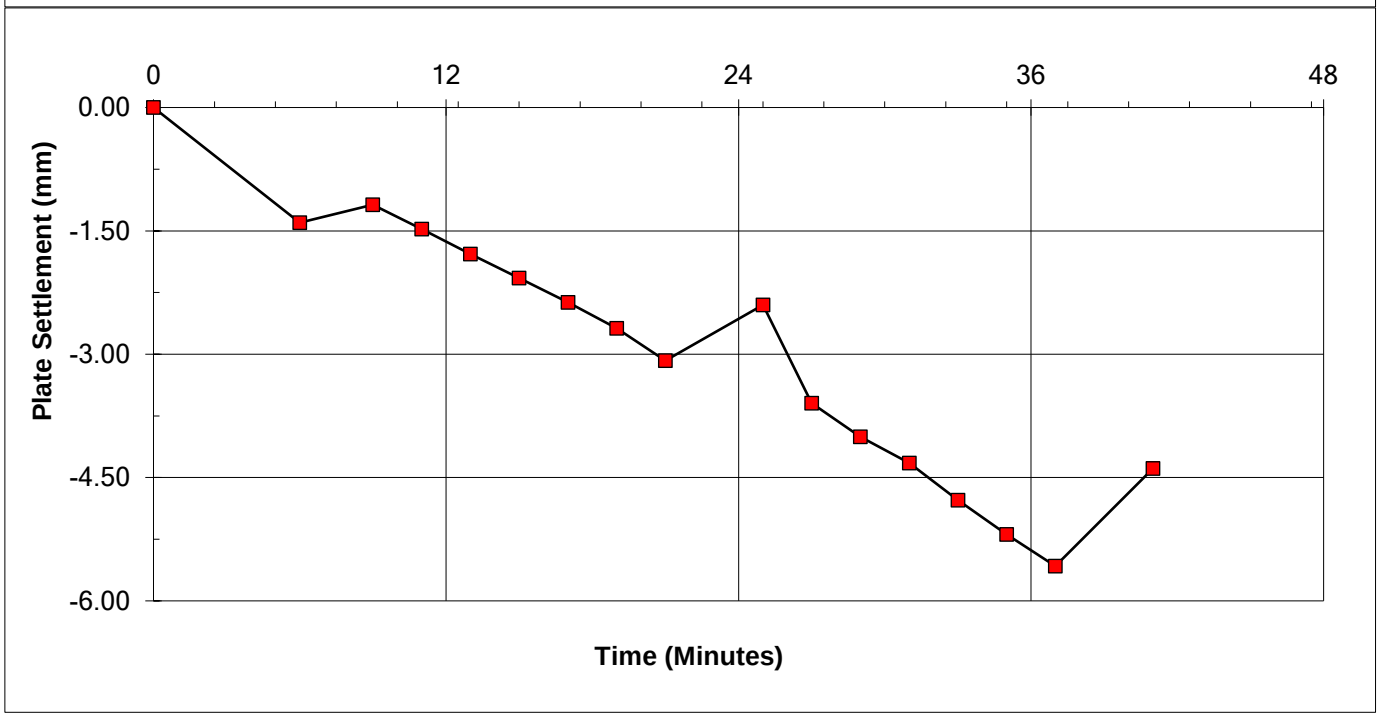
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 05-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/48
Date of Issue 06 September 2022

Approved Signatories

S J Hutchings, O P Davies

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MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	05-Sep-22	**JOB NUMBER**	MRN 4454/48
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C13 L6	225	1.69	1.46	16	102.8	2.4
2	D13 L6	225	1.70	1.45	17	102.1	1.1
3	C8 L9	225	1.62	1.45	12	102.3	8.8
4	E9 L9	225	1.61	1.44	12	101.5	9.2
5	D10 L9	225	1.60	1.36	17	96.0	6.9
6	E10 L9	225	1.58	1.38	15	96.9	8.6
7	F10 L9	225	1.64	1.41	16	99.3	5.2
8	D11 L9	225	1.63	1.46	11.3	103.0	8.5
9	E11 L9	225	1.62	1.47	10	103.6	9.7
10	D11 L9	225	1.64	1.44	14	101.1	6.0
11	D12 L9	225	1.62	1.44	13	101.3	8.1
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.42	(Advised by client)	
				Particle Density (Mg/m3)	1.95	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 06-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	Test 01 - C13 L6			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/48			
TEST LOCATION	Test 01 - C13 L6	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	05-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4763	4740	4671	4725	0.00	0.00	0.0
4610	4700	4527	4612	-1.12	17.00	60.1
4678	4748	4580	4669	-0.56	0.00	0.0
4649	4723	4556	4643	-0.82	7.00	24.8
4624	4702	4534	4620	-1.05	11.00	38.9
4599	4670	4507	4592	-1.33	19.00	67.2
4564	4647	4480	4564	-1.61	24.00	84.9
4527	4608	4449	4528	-1.97	30.00	106.1
4495	4574	4418	4496	-2.29	35.00	123.8
4597	4661	4527	4595	-1.30	0.00	0.0
4571	4638	4497	4569	-1.56	3.00	10.6
4545	4616	4473	4545	-1.80	8.00	28.3
4520	4597	4442	4520	-2.05	17.00	60.1
4493	4575	4416	4495	-2.30	23.00	81.3
4477	4572	4390	4480	-2.45	33.00	116.7
4442	4542	4362	4449	-2.76	40.00	141.5
4538	4621	4452	4537	-1.88	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	97	kPa
Modulus of subgrade reaction (k) =	77	MPa/m
Equivalent 762 mm plate reaction =	62	MPa/m
Equivalent CBR =	12.4	%
Surface Stiffness Modulus (E) =	88	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	124	kPa
Modulus of subgrade reaction (k) =	100	MPa/m
Equivalent 762 mm plate reaction =	80	MPa/m
Equivalent CBR =	19.2	%
Surface Stiffness Modulus (E) =	117	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 06-Sep-22

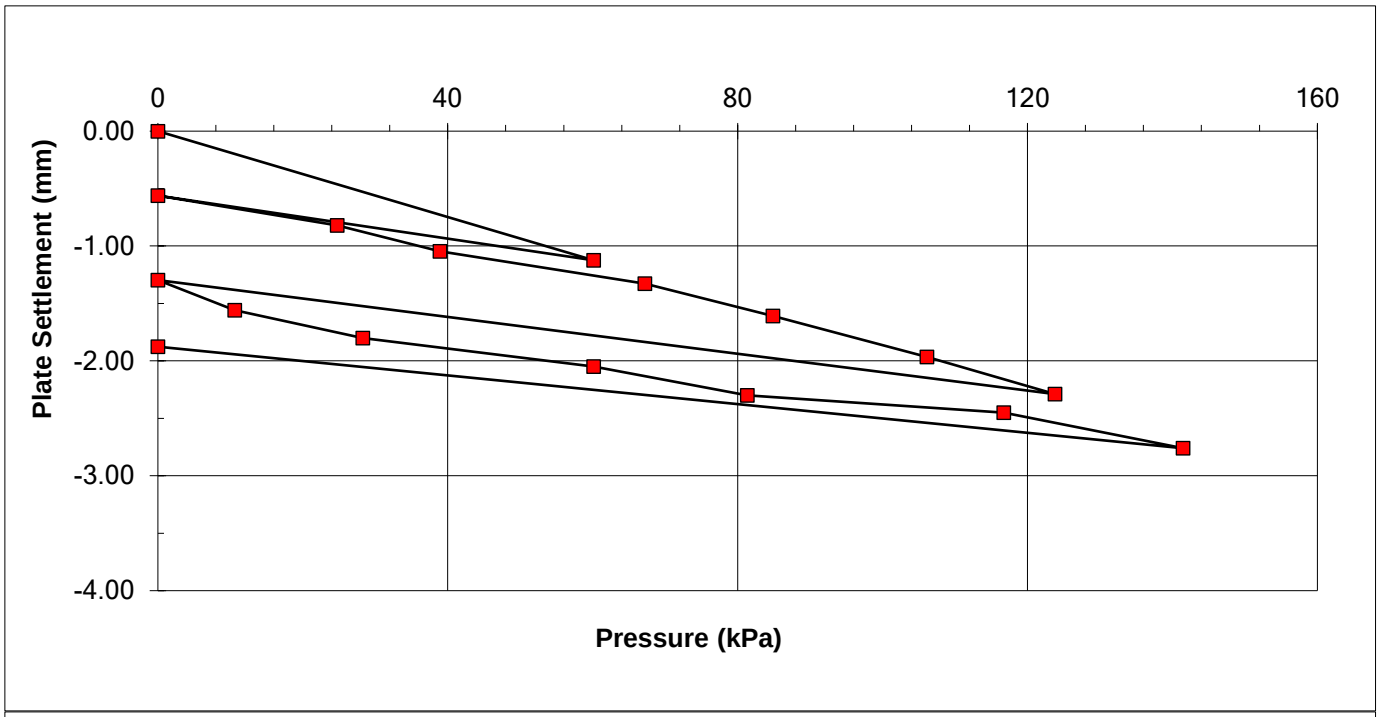
MURRAY RIX

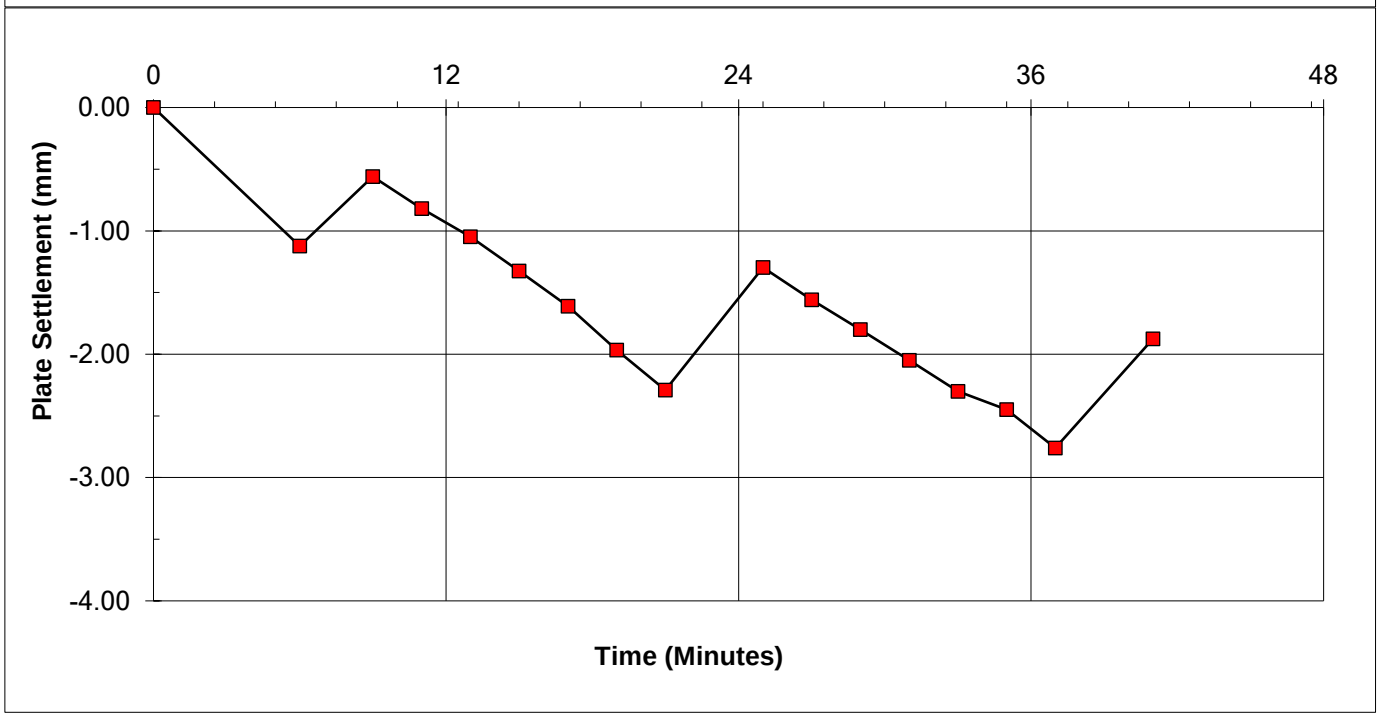
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 06-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/48A
Date of Issue 06 September 2022
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	05-Sep-22	**JOB NUMBER**	MRN 4454/48A
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C13 L6	225	1.69	1.46	16	102.8	2.4
2	D13 L6	225	1.70	1.45	17	102.1	1.1
3	C8 L9	225	1.62	1.45	12	102.3	8.8
4	E9 L9	225	1.61	1.44	12	101.5	9.2
5	D10 L9	225	1.60	1.36	17	96.0	6.9
6	E10 L9	225	1.58	1.38	15	96.9	8.6
7	F10 L9	225	1.64	1.41	16	99.3	5.2
8	D11 L9	225	1.63	1.46	11.3	103.0	8.5
9	E11 L9	225	1.62	1.47	10	103.6	9.7
10	F11 L9	225	1.64	1.44	14	101.1	6.0
11	D12 L9	225	1.62	1.44	13	101.3	8.1
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.42	(Advised by client)	
				Particle Density (Mg/m3)	1.95	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 06-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	Test 01 - C13 L6				
SITE	Stopes Road, Bolton				
JOB NUMBER	MRN 4454/48A				
TEST LOCATION	Test 01 - C13 L6	LOADING DEVICE	20 Tonne Enerpac Jack		
TEST DATE	05-Sep-22	PLATE SIZE (mm)	600 diameter		
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant		
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required		

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4763	4740	4671	4725	0.00	0.00	0.0
4610	4700	4527	4612	-1.12	17.00	60.1
4678	4748	4580	4669	-0.56	0.00	0.0
4649	4723	4556	4643	-0.82	7.00	24.8
4624	4702	4534	4620	-1.05	11.00	38.9
4599	4670	4507	4592	-1.33	19.00	67.2
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4495	4574	4418	4496	-2.29	35.00	123.8
4597	4661	4527	4595	-1.30	0.00	0.0
4571	4638	4497	4569	-1.56	3.00	10.6
4545	4616	4473	4545	-1.80	8.00	28.3
4520	4597	4442	4520	-2.05	17.00	60.1
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4538	4621	4452	4537	-1.88	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	97	kPa
Modulus of subgrade reaction (k) =	77	MPa/m
Equivalent 762 mm plate reaction =	62	MPa/m
Equivalent CBR =	12.4	%
Surface Stiffness Modulus (E) =	88	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	124	kPa
Modulus of subgrade reaction (k) =	100	MPa/m
Equivalent 762 mm plate reaction =	80	MPa/m
Equivalent CBR =	19.2	%
Surface Stiffness Modulus (E) =	117	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 06-Sep-22

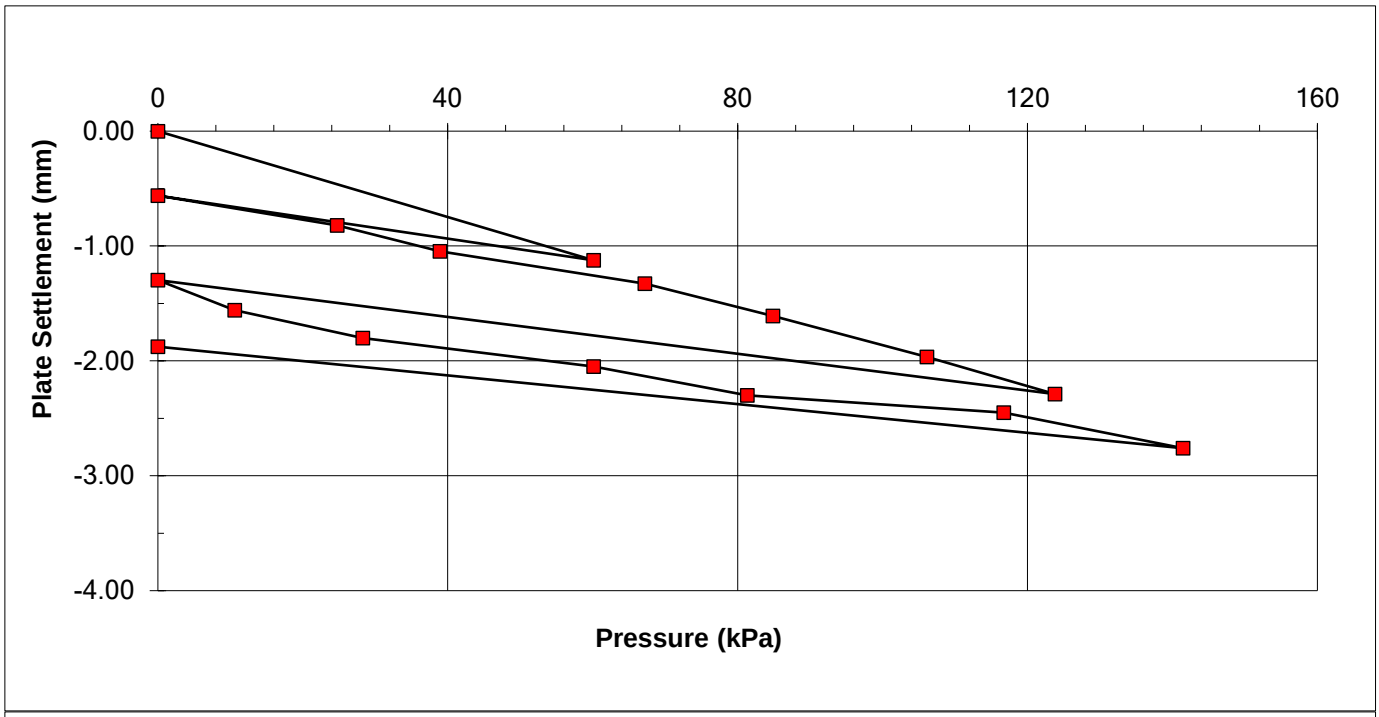
MURRAY RIX

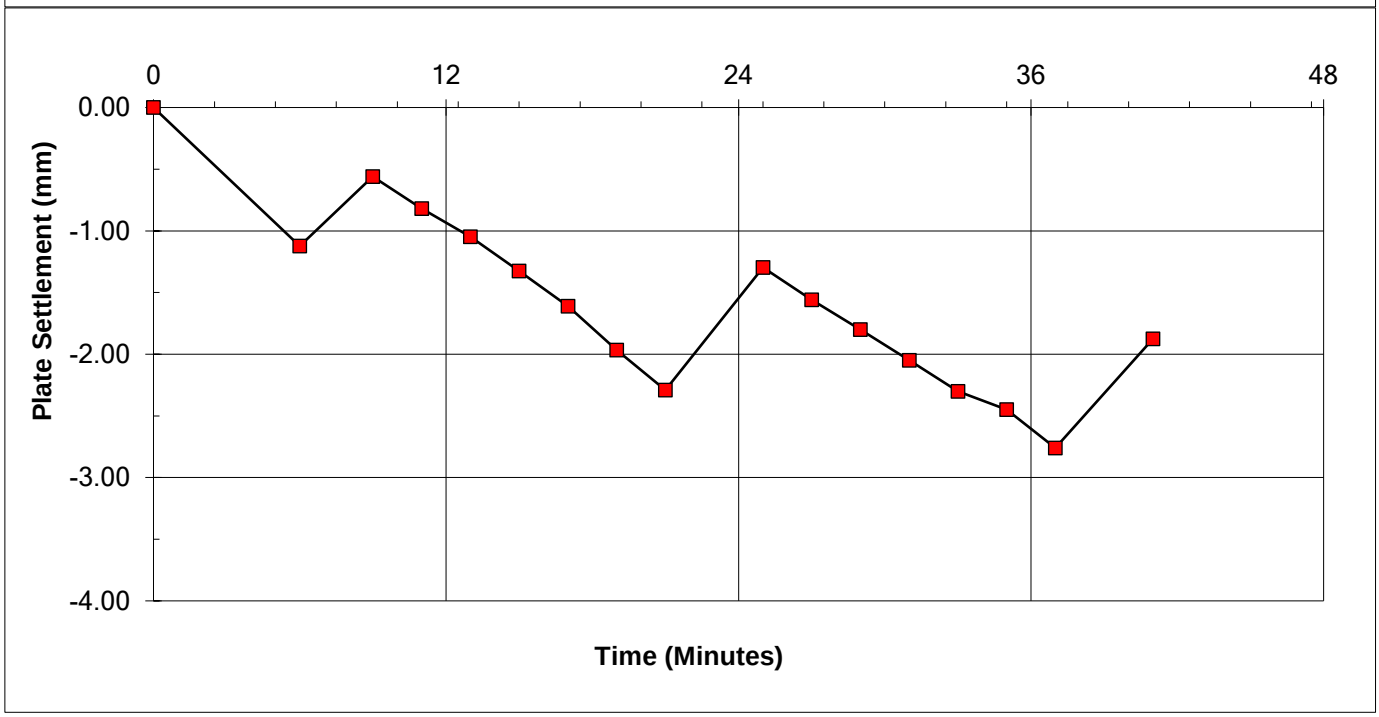
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 06-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/49
Date of Issue 08 September 3033

Approved Signatories

S J Hutchings, O P Davies

Notes

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Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/49

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	06/09/2022
DATE OF TEST	06/09/2033	SAMPLED BY	Murray Rix
DATE TESTED	07/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116453	SRD D12 L9	Black Ash/Sand	1.70	1.49	14	98.0	7.5
116454	SRD C8 L9	Black Ash/Sand	1.75	1.53	14	100.7	5.0
		Maximum Dry Density (Mg/m^3)		1.52		(Advised by client)	
		Particle Density (Mg/m^3)		2.08		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 08-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/50
Date of Issue 08 September 2022

Approved Signatories

S J Hutchings, O P Davies

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	07-Sep-22	**JOB NUMBER**	MRN 4454/50
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D19 L3	225	1.87	1.62	15	103.2	0.7
2	C19 L3	225	1.79	1.57	14	99.7	5.8
3	C18 L3	225	1.75	1.54	13	98.3	8.5
4	D18 L3	225	1.78	1.57	13	99.9	6.9
5	D17 L3	225	1.74	1.51	15	96.1	7.7
6	C17 L3	225	1.84	1.55	18	99.0	0.1
7	C15 L3	225	1.76	1.54	14	97.9	7.2
8	C16 L3	225	1.75	1.53	14	97.4	7.8
9	D15 L3	225	1.80	1.62	11	102.9	7.5
10	D16 L3	225	1.80	1.56	15	99.4	4.5
11	F11 L10	225	1.80	1.56	15	99.4	4.5
12	E11 L10	225	1.80	1.55	16	98.7	3.8
13	B15 L2	225	1.86	1.61	15	102.8	1.4
14	B16 L2	225	1.89	1.65	14	105.2	0.4
15	A15 L2	225	1.82	1.61	13	102.4	5.0
16	A16 L2	225	1.78	1.60	11	101.8	8.5
17	D11 L10	225	1.78	1.59	12	101.0	7.9
18	A17 L2	225	1.83	1.63	12	103.7	5.2
19	B17 L2	225	1.81	1.63	11	103.7	7.1
20	F10 L10	225	1.76	1.58	11	100.7	9.6
				Maximum Dry Density (Mg/m3)	1.57	(Advised by client)	
				Particle Density (Mg/m3)	2.18	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 08-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	07-Sep-22	**JOB NUMBER**	MRN 4454/50
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	E9 L10	225	1.78	1.58	13	100.5	7.0
22	C8 L10	225	1.79	1.56	15	99.4	5.4
23	E10 L10	225	1.78	1.57	13	100.1	7.0
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
					Maximum Dry Density (Mg/m3)	1.57	(Advised by client)
					Particle Density (Mg/m3)	2.18	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 08-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	Test 01 - C13 L6			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/50			
TEST LOCATION	Test 01 - B15 L4	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	07-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4524	4630	4747	4634	0.00	0.00	0.0
4374	4502	4606	4494	-1.40	5.00	17.7
4397	4529	4623	4516	-1.17	0.00	0.0
4371	4491	4593	4485	-1.49	6.00	21.2
4351	4471	4558	4460	-1.74	9.00	31.8
4318	4450	4523	4430	-2.03	12.00	42.4
4286	4432	4509	4409	-2.25	15.00	53.1
4250	4392	4486	4376	-2.58	18.00	63.7
4222	4357	4458	4346	-2.88	22.00	77.8
4345	4396	4524	4422	-2.12	0.00	0.0
4313	4373	4486	4391	-2.43	9.00	31.8
4281	4349	4454	4361	-2.72	12.00	42.4
4246	4315	4419	4327	-3.07	19.00	67.2
4213	4290	4382	4295	-3.39	22.00	77.8
4180	4263	4346	4263	-3.71	26.00	92.0
4148	4235	4318	4234	-4.00	30.00	106.1
4253	4332	4427	4337	-2.96	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	59	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.2	%
Surface Stiffness Modulus (E) =	51	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	77	kPa
Modulus of subgrade reaction (k) =	62	MPa/m
Equivalent 762 mm plate reaction =	50	MPa/m
Equivalent CBR =	8.4	%
Surface Stiffness Modulus (E) =	69	MN/m^2

Surface Stiffness Modulus Ratio =	1.4

DATE 08-Sep-22

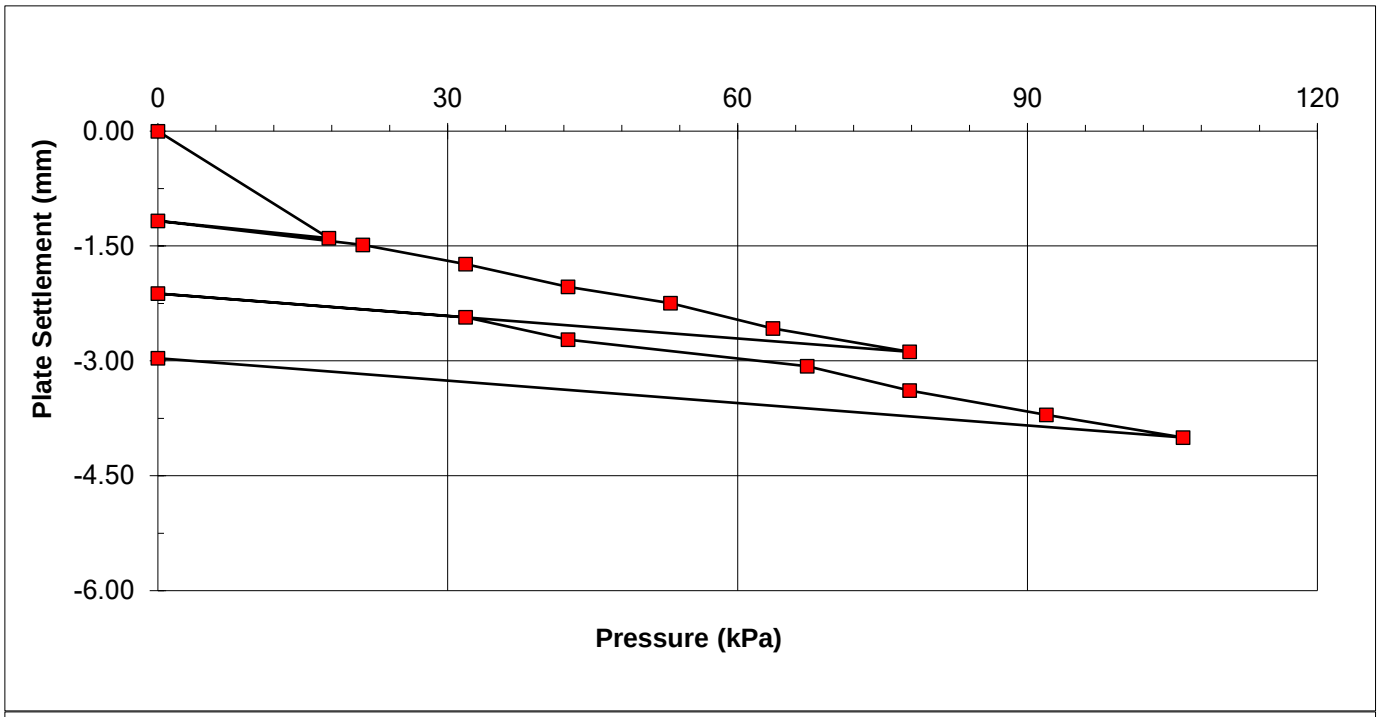
MURRAY RIX

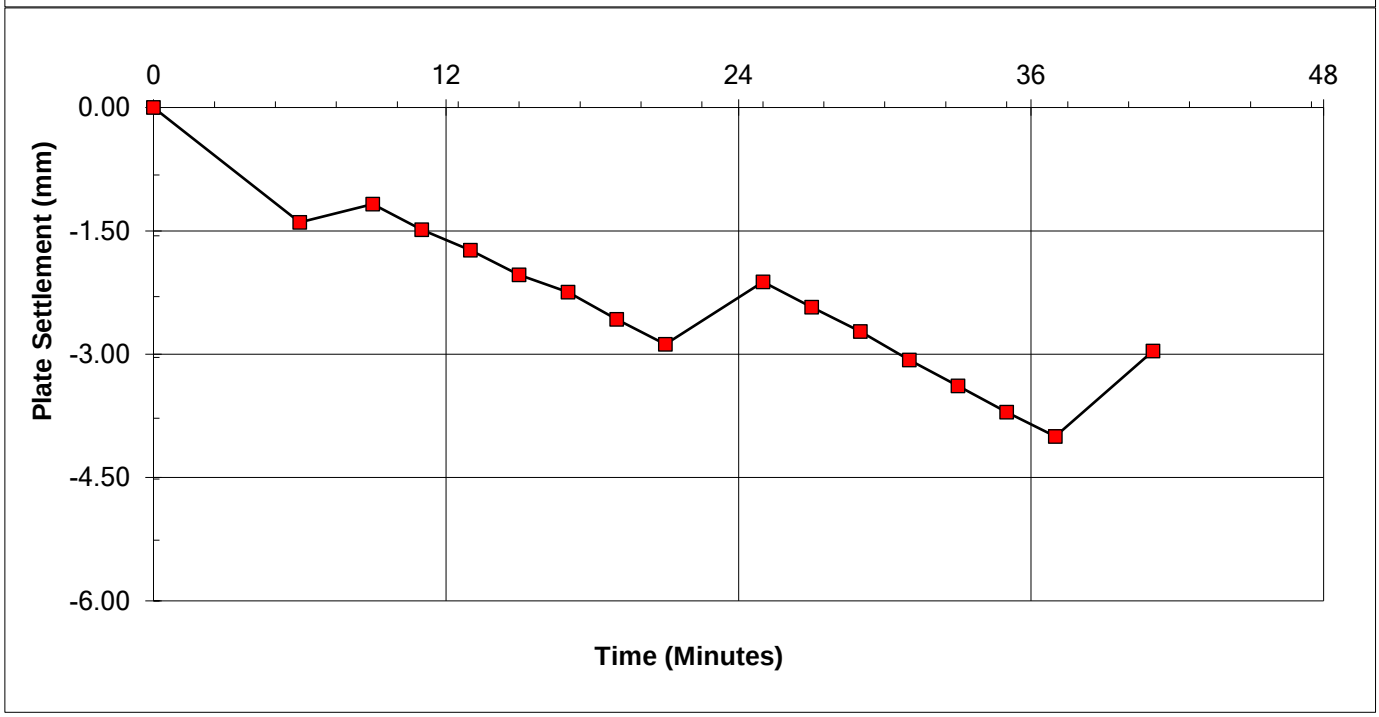
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 08-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/51
Date of Issue 10 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

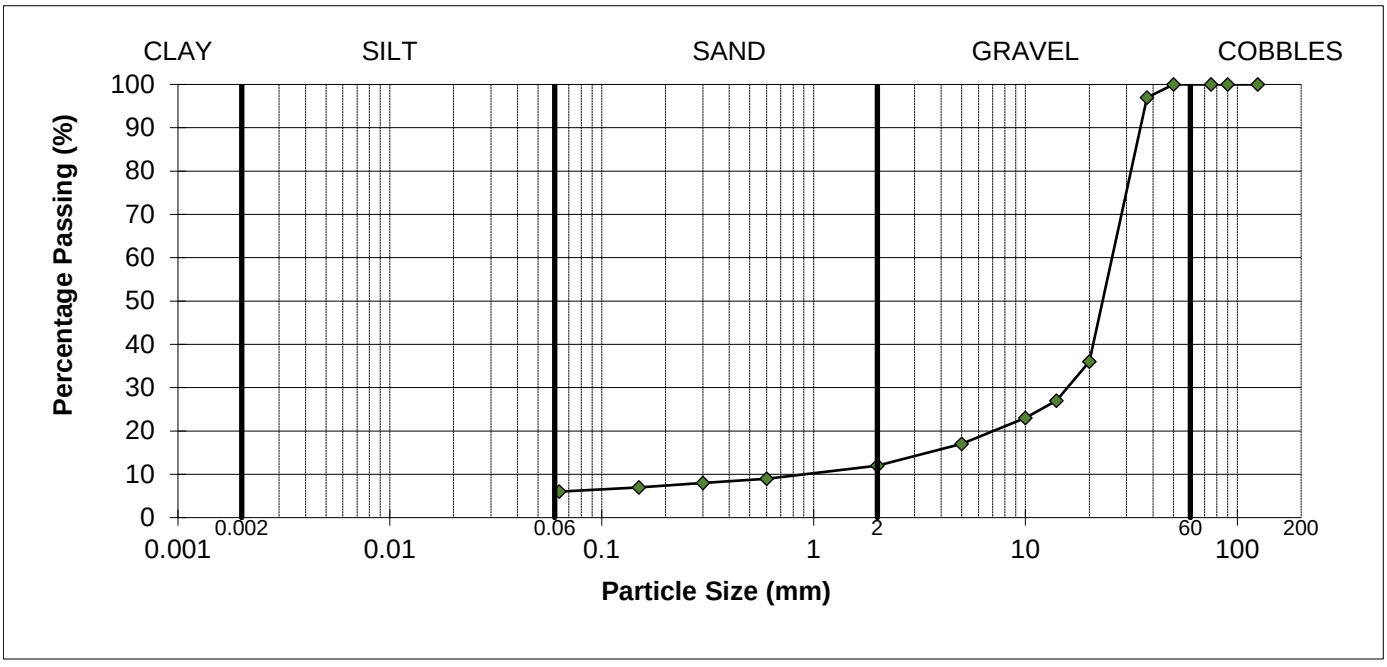
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	SP-YELLOW GREY-1	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114694	DATE RECEIVED	21-Jul-22
DATE TESTED	01-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	23	
90	100		5	17	
75	100		2	12	
50	100		0.6	9	
37.5	97		0.3	8	
20	36		0.15	7	
14	27		0.063	6	



REMARKS
As received moisture content = 1.0%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 10-Sep-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

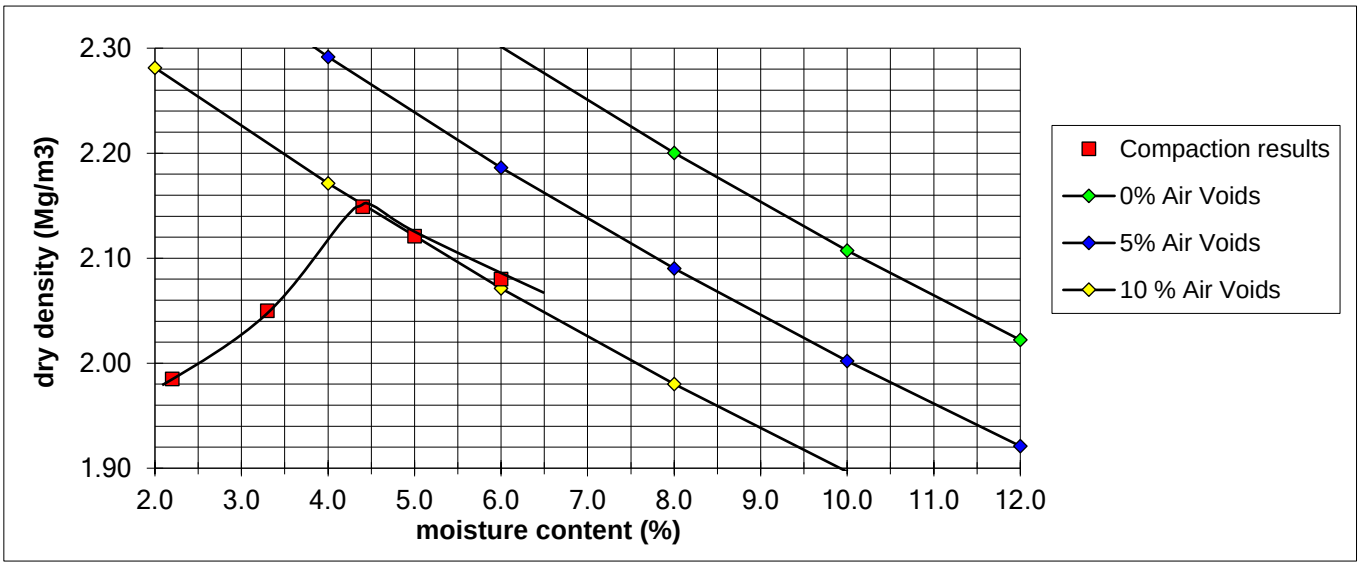
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	SP-YELLOW GREY-1	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114694	DATE RECEIVED	21-Jul-22
DATE TESTED	01-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	2.2	1.985
2	3.3	2.050
3	4.4	2.149
4	5.0	2.121
5	6.0	2.080
Optimum	4.3	
Maximum		2.15
Particle Density	2.67 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 3%
Percentage of material retained on 20mm sieve = 64%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 10-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO
BS 1377: PART 4: Clause 7: 1990
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2 (oven dry)

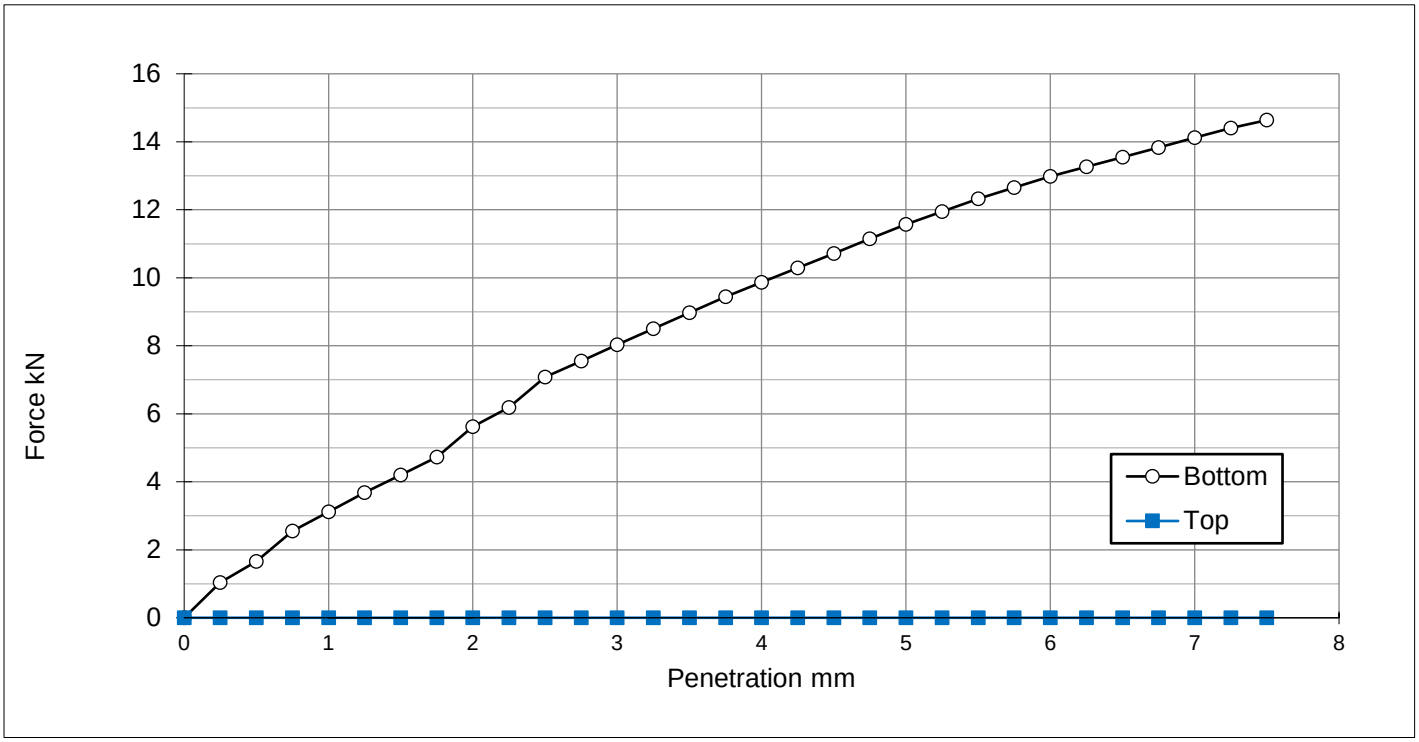
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	TP-YELLOW GREY-1	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114694	DATE RECEIVED	21-Jul-22
DATE TESTED	10-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		64 %			
BULK DENSITY	2.24 Mg/m3	MOISTURE CONTENT	4.3 %	DRY DENSITY	2.15 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	58	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	4.3	%

REMARKS
Sample re-compacted to OMC/MDD.

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 10-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

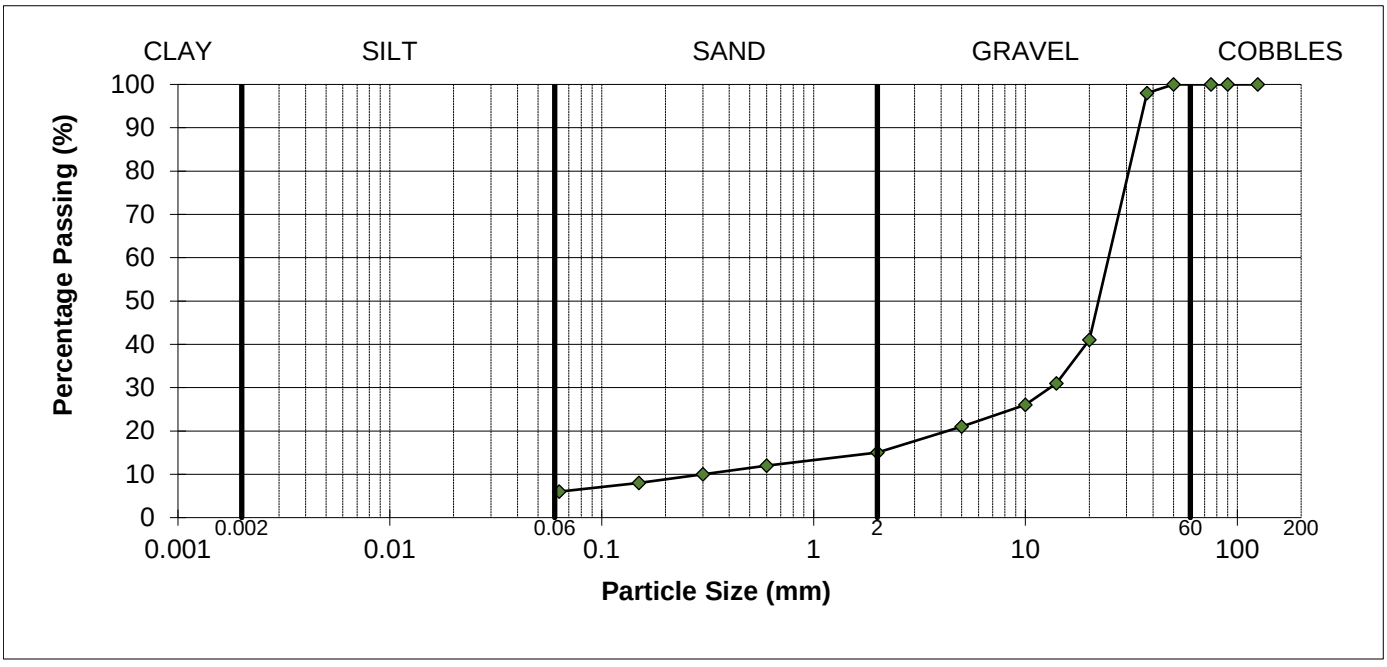
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	SP-YELLOW GREY-2	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114695	DATE RECEIVED	21-Jul-22
DATE TESTED	01-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	26	
90	100		5	21	
75	100		2	15	
50	100		0.6	12	
37.5	98		0.3	10	
20	41		0.15	8	
14	31		0.063	6	



REMARKS
As received moisture content = 0.6%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 10-Sep-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

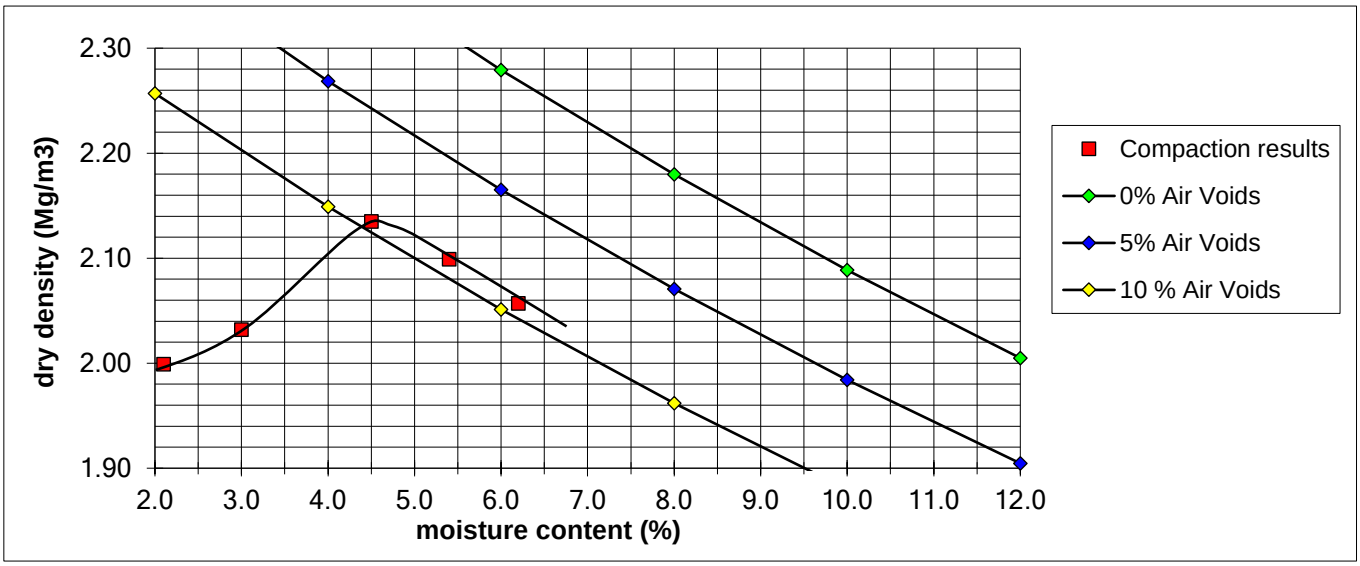
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	SP-YELLOW GREY-2	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114695	DATE RECEIVED	21-Jul-22
DATE TESTED	01-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	2.1	1.999
2	3.0	2.032
3	4.5	2.135
4	5.4	2.099
5	6.2	2.057
Optimum	4.5	
Maximum		2.13
Particle Density	2.64 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 2%
Percentage of material retained on 20mm sieve = 59%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 10-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO
BS 1377: PART 4: Clause 7: 1990
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2 (oven dry)

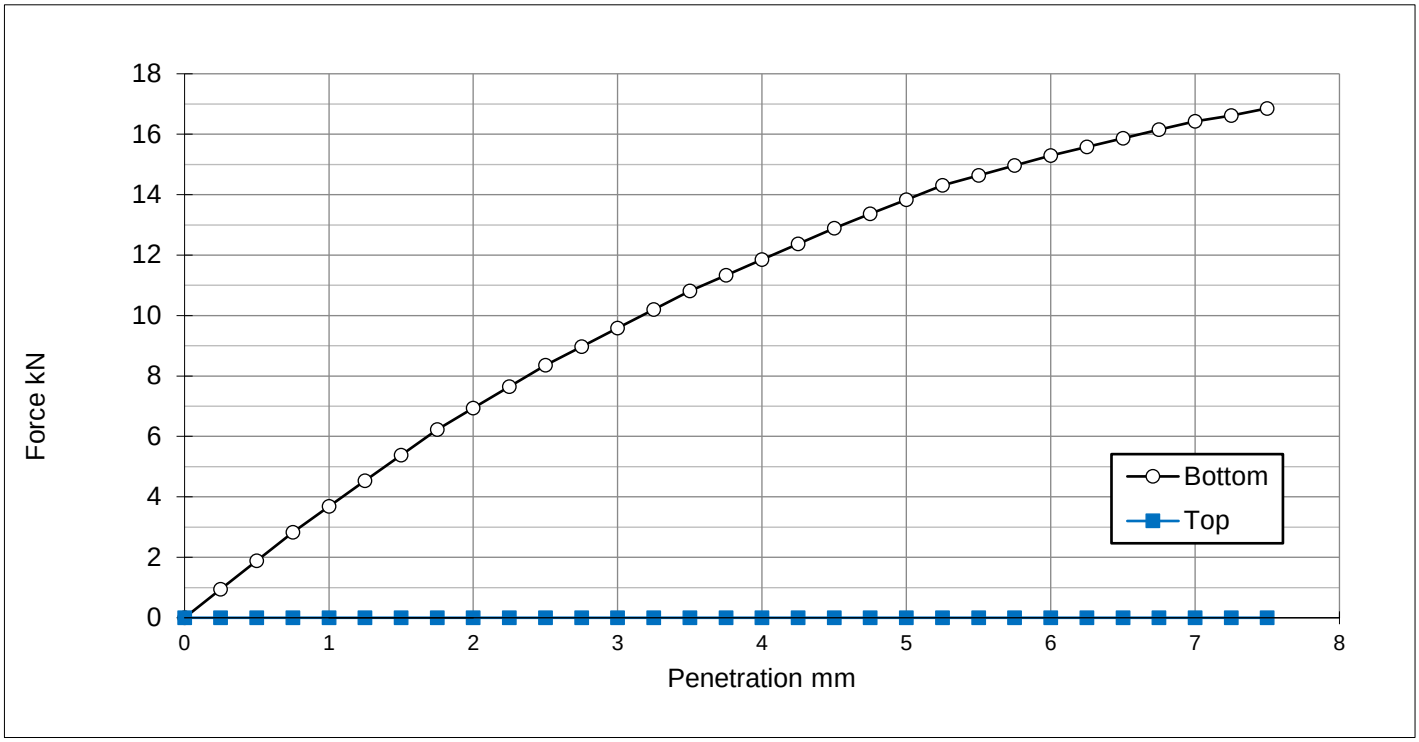
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/51

SAMPLE LABEL	TP-YELLOW GREY-2	DATE SAMPLED	20-Jul-22
LAB SAMPLE No	114695	DATE RECEIVED	21-Jul-22
DATE TESTED	10-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		59 %			
BULK DENSITY	2.23 Mg/m3	MOISTURE CONTENT	4.5 %	DRY DENSITY	2.13 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	69	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	4.5	%

REMARKS
Sample re-compacted to OMC/MDD.

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 10-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/52
Date of Issue 10 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

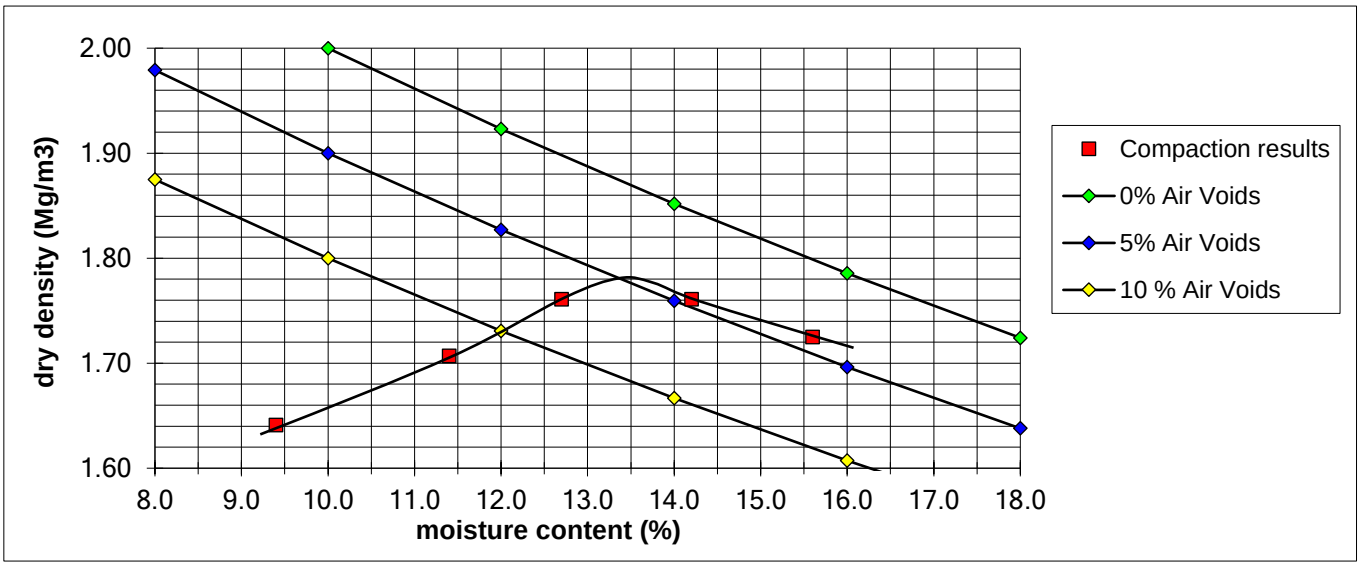
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/52

SAMPLE LABEL	SM-1	DATE SAMPLED	23-Aug-22
LAB SAMPLE No	115927	DATE RECEIVED	23-Aug-22
DATE TESTED	26-Aug-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	SP1
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		9.4	1.641
2		11.4	1.707
3		12.7	1.761
4		14.2	1.761
5		15.6	1.725
	Optimum	13.0	
	Maximum		1.78
	Particle Density	2.50 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 16%
Percentage of material retained on 20mm sieve = 41%
As received moisture content = 4.7%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 10-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/53
Date of Issue 12 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	09-Sep-22	**JOB NUMBER**	MRN 4454/53
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B17 L3	225	1.90	1.62	17	97.5	0.1
2	A17 L3	225	1.81	1.59	14	95.8	-7.5
3	A16 L3	225	1.92	1.66	15	100.0	-0.7
4	A15 L3	225	1.89	1.64	15	98.7	-2.0
5	B15 L3	225	1.94	1.72	13	103.4	-1.7
6	B16 L3	225	1.92	1.60	20	96.2	3.3
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
					Particle Density (Mg/m3)	2.25	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 12-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/53

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	09/09/2022
DATE OF TEST	09/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	10/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116551	SRD B15 L3	Black Ash/Sand	1.95	1.59	14	103.0	0.1
116552	SRD B17 L3	Black Ash/Sand	1.90	1.35	17	97.8	0.3
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 12-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	Stopes Road, Bolton		
JOB NUMBER	MRN 4454/53		
TEST LOCATION	Test 01 - C19 L4	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	09-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4870	4853	4904	4876	0.00	0.00	0.0
4716	4706	4756	4726	-1.50	12.00	42.4
4755	4728	4769	4751	-1.25	0.00	0.0
4723	4704	4742	4723	-1.53	6.00	21.2
4696	4624	4716	4679	-1.97	12.00	42.4
4669	4607	4695	4657	-2.19	17.00	60.1
4641	4576	4670	4629	-2.47	21.00	74.3
4605	4548	4640	4598	-2.78	28.00	99.0
4560	4511	4602	4558	-3.18	34.00	120.3
4659	4617	4667	4648	-2.28	0.00	0.0
4633	4597	4638	4623	-2.53	5.00	17.7
4602	4567	4614	4594	-2.81	9.00	31.8
4575	4532	4587	4565	-3.11	16.00	56.6
4549	4503	4562	4538	-3.38	23.00	81.3
4519	4476	4534	4510	-3.66	32.00	113.2
4489	4445	4507	4480	-3.95	39.00	137.9
4584	4525	4627	4579	-2.97	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	77	kPa
Modulus of subgrade reaction (k) =	62	MPa/m
Equivalent 762 mm plate reaction =	49	MPa/m
Equivalent CBR =	8.3	%
Surface Stiffness Modulus (E) =	68	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	99	kPa
Modulus of subgrade reaction (k) =	79	MPa/m
Equivalent 762 mm plate reaction =	63	MPa/m
Equivalent CBR =	12.8	%
Surface Stiffness Modulus (E) =	90	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 12-Sep-22

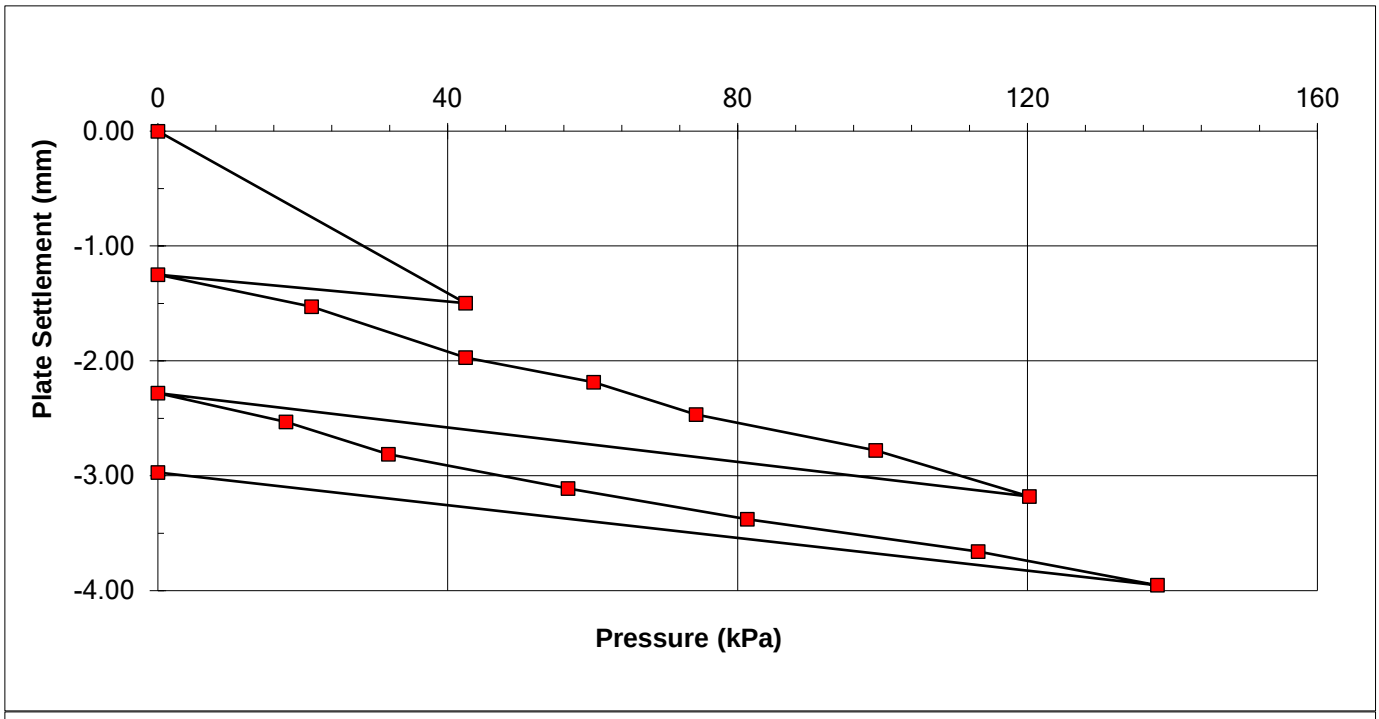
MURRAY RIX

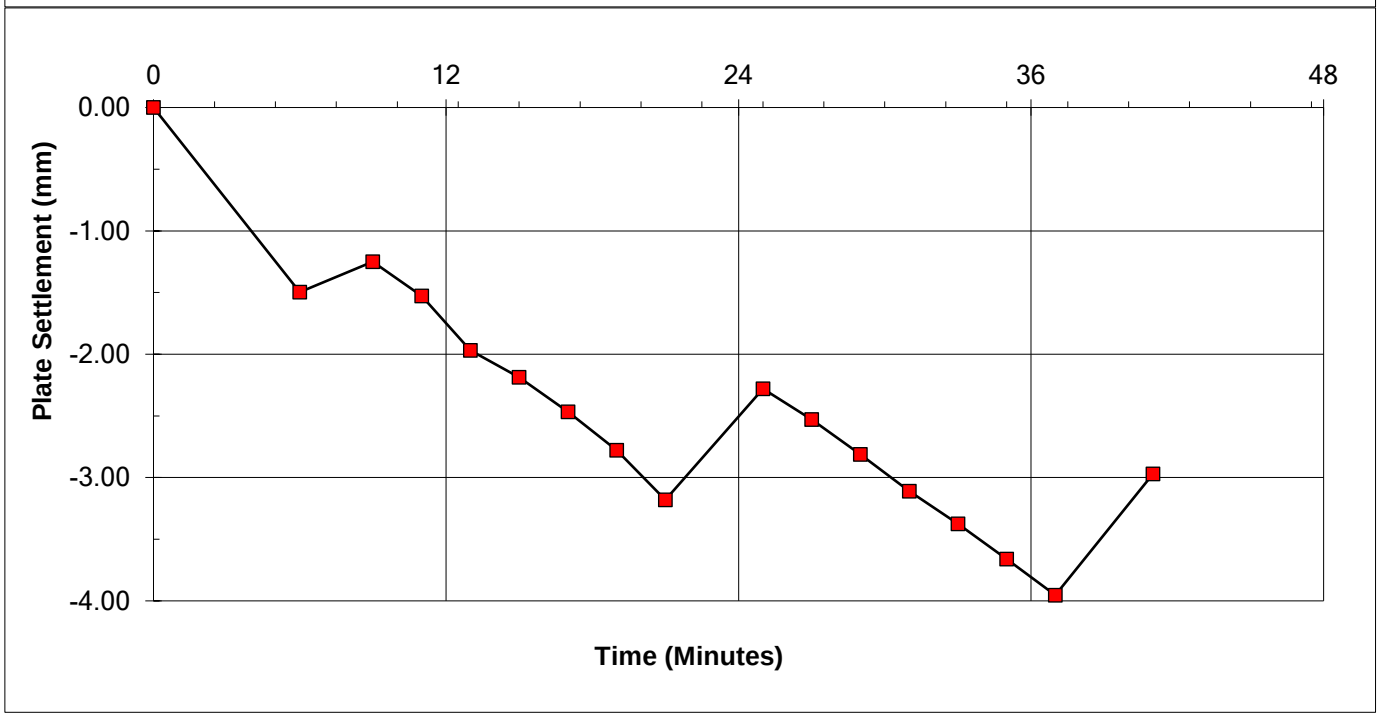
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 12-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/53			
TEST LOCATION	Test 02 - D12 L9	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	09-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4728	4697	4627	4684	0.00	0.00	0.0
4565	4556	4486	4536	-1.48	63.00	222.8
4631	4593	4533	4586	-0.98	0.00	0.0
4504	4566	4501	4524	-1.60	23.00	81.3
4452	4529	4466	4482	-2.02	80.00	282.9
4425	4503	4442	4457	-2.27	100.00	353.7
4398	4475	4414	4429	-2.55	120.00	424.4
4367	4446	4391	4401	-2.83	140.00	495.1
4338	4416	4365	4373	-3.11	160.00	565.9
4568	4619	4517	4568	-1.16	0.00	0.0
4537	4597	4496	4543	-1.41	10.00	35.4
4511	4575	4472	4519	-1.65	18.00	63.7
4480	4548	4442	4490	-1.94	28.00	99.0
4452	4521	4414	4462	-2.22	40.00	141.5
4424	4496	4383	4434	-2.50	60.00	212.2
4392	4467	4345	4401	-2.83	80.00	282.9
4533	4587	4477	4532	-1.52	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	343	kPa
Modulus of subgrade reaction (k) =	274	MPa/m
Equivalent 762 mm plate reaction =	221	MPa/m
Equivalent CBR =	111.0	%
Surface Stiffness Modulus (E) =	359	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	190	kPa
Modulus of subgrade reaction (k) =	152	MPa/m
Equivalent 762 mm plate reaction =	122	MPa/m
Equivalent CBR =	40.1	%
Surface Stiffness Modulus (E) =	187	MN/m^2

Surface Stiffness Modulus Ratio =	0.5

DATE 12-Sep-22

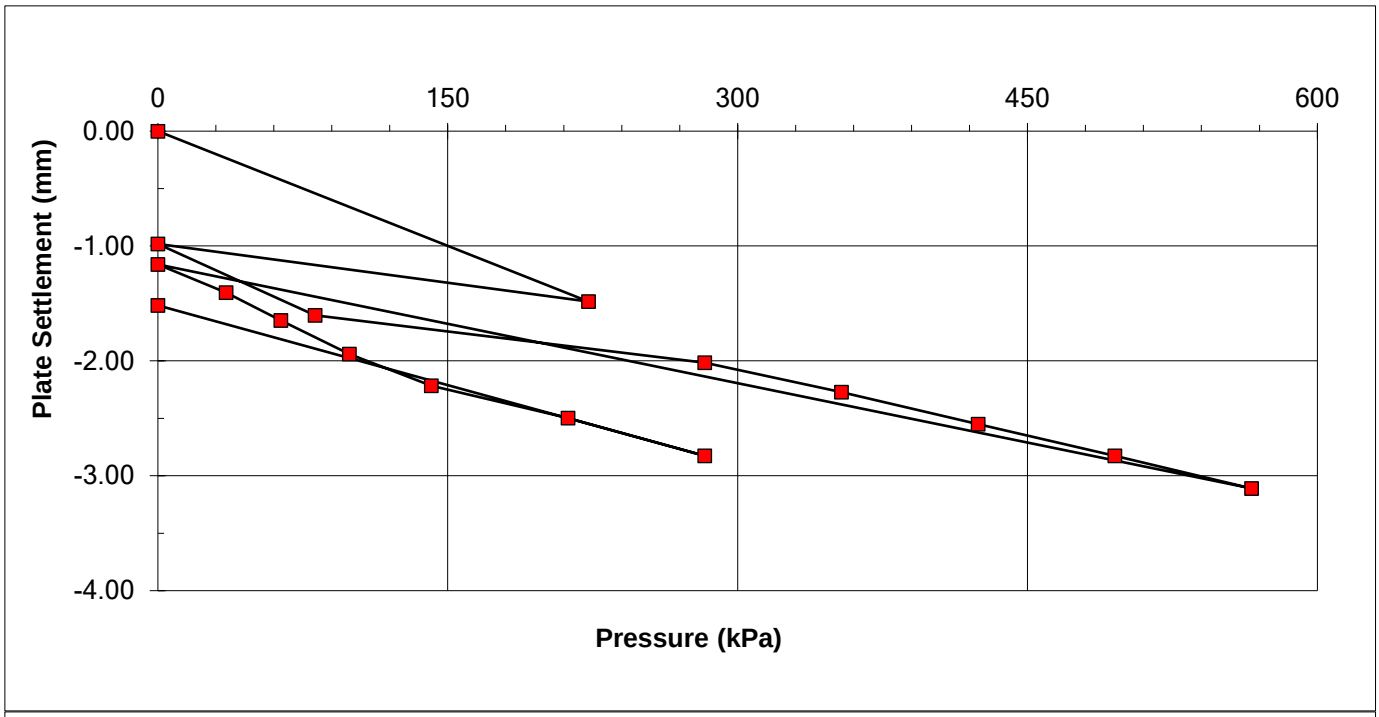
MURRAY RIX

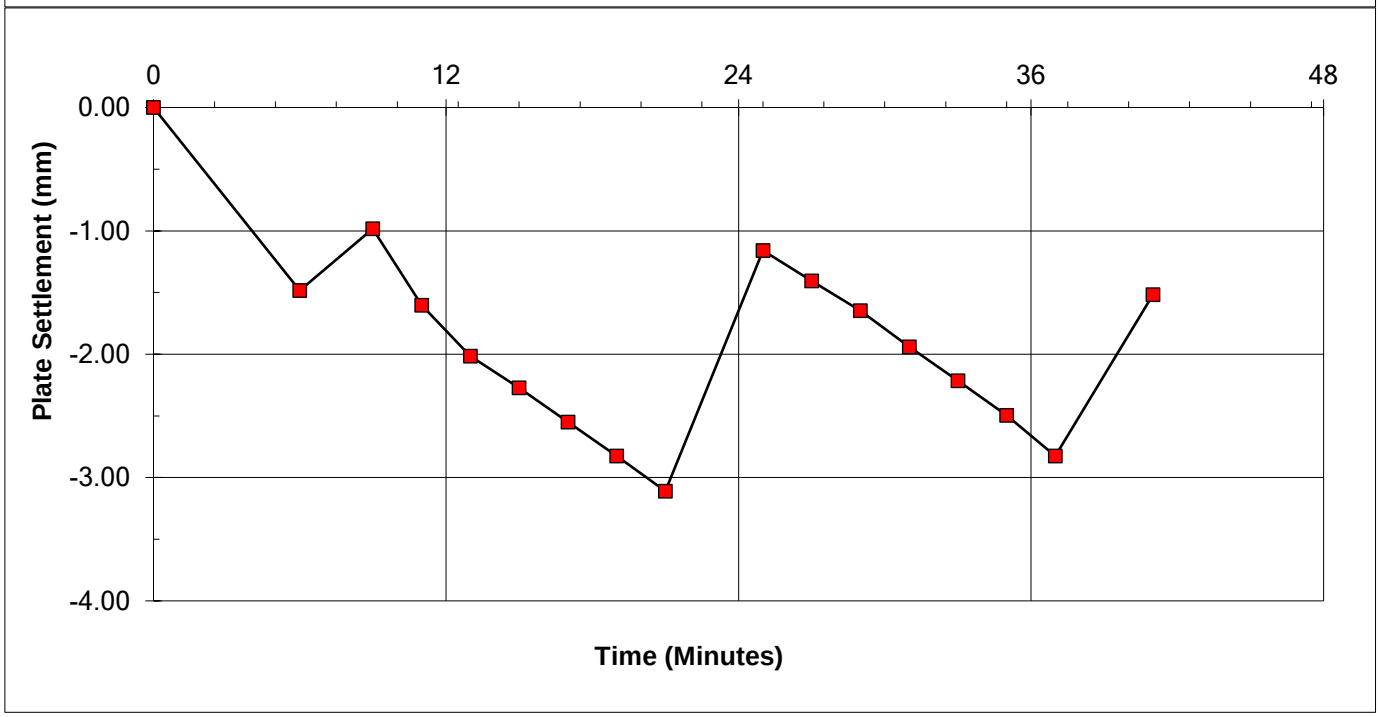
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 12-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/54
Date of Issue 13 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/54			
TEST LOCATION	Test 01 - D12 L9	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	12-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4666	4580	4589	4612	0.00	0.00	0.0
4511	4435	4447	4464	-1.47	17.00	60.1
4561	4488	4479	4509	-1.02	0.00	0.0
4529	4447	4446	4474	-1.38	11.00	38.9
4497	4413	4421	4444	-1.68	20.00	70.7
4461	4376	4396	4411	-2.01	28.00	99.0
4429	4340	4368	4379	-2.33	37.00	130.9
4392	4300	4338	4343	-2.68	45.00	159.2
4350	4261	4309	4307	-3.05	54.00	191.0
4430	4386	4395	4404	-2.08	0.00	0.0
4405	4353	4370	4376	-2.36	20.00	70.7
4379	4321	4348	4349	-2.62	30.00	106.1
4346	4288	4323	4319	-2.93	50.00	176.8
4316	4258	4301	4292	-3.20	54.00	191.0
4276	4218	4270	4255	-3.57	74.00	261.7
4237	4181	4240	4219	-3.92	88.00	311.2
4370	4317	4360	4349	-2.63	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	126	kPa
Modulus of subgrade reaction (k) =	100	MPa/m
Equivalent 762 mm plate reaction =	81	MPa/m
Equivalent CBR =	19.5	%
Surface Stiffness Modulus (E) =	118	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	216	kPa
Modulus of subgrade reaction (k) =	173	MPa/m
Equivalent 762 mm plate reaction =	139	MPa/m
Equivalent CBR =	49.8	%
Surface Stiffness Modulus (E) =	215	MN/m^2

Surface Stiffness Modulus Ratio =	1.8

DATE 13-Sep-22

MURRAY RIX

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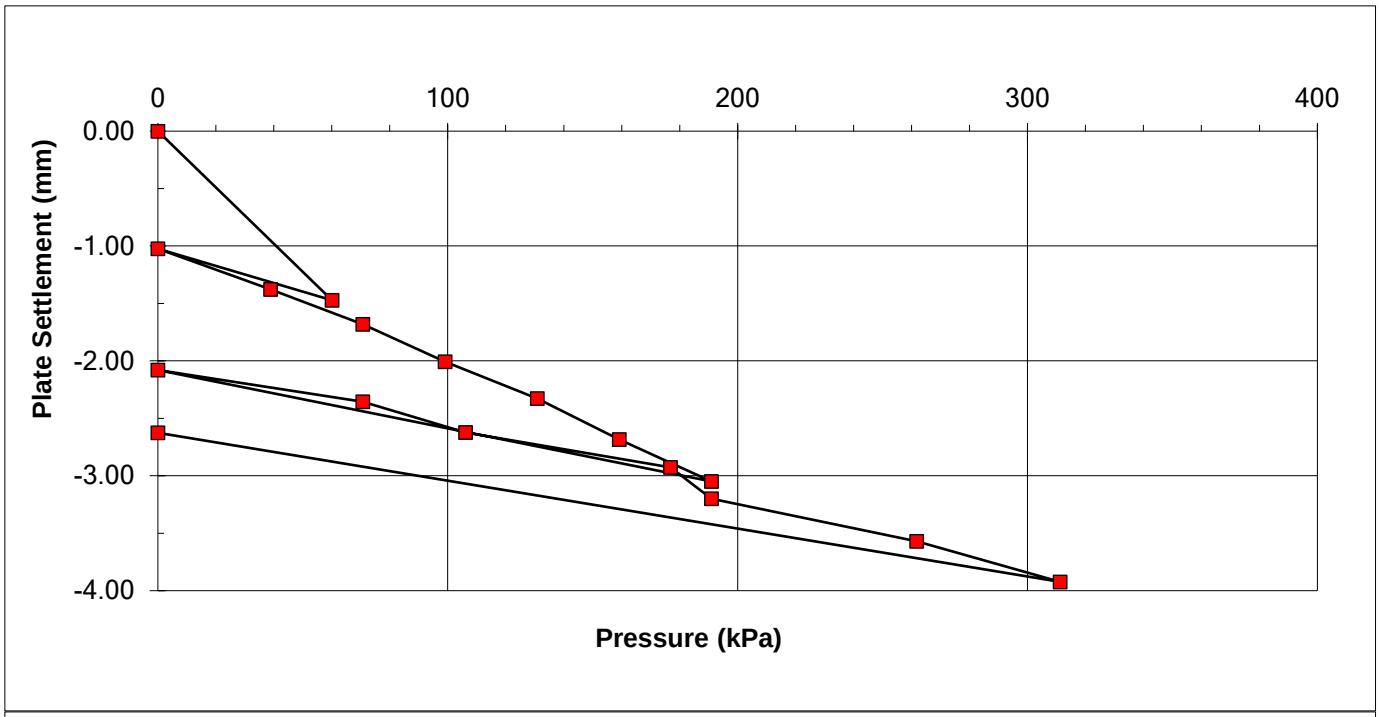
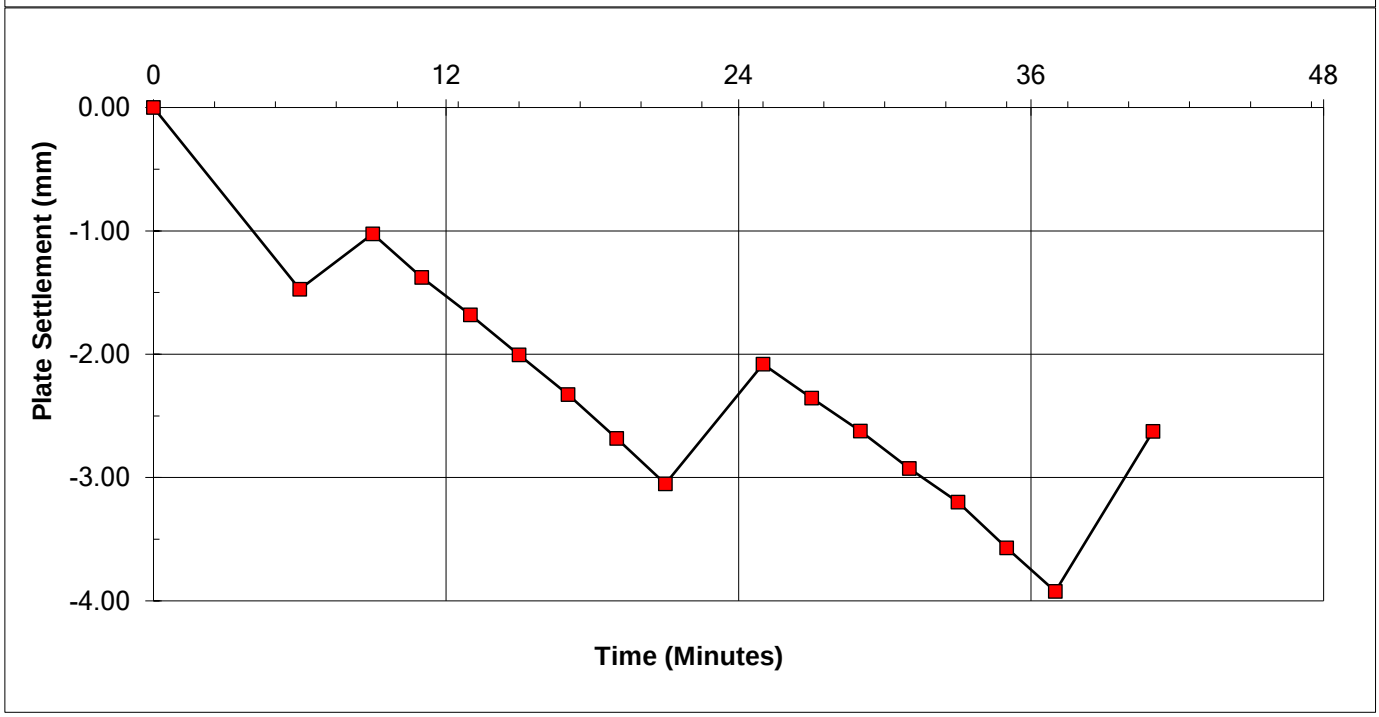
PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Sep-22

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/54			
TEST LOCATION	Test 02 - D10 L11	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	12-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4570	4561	4595	4575	0.00	0.00	0.0
4419	4396	4456	4424	-1.52	28.00	99.0
4471	4489	4525	4495	-0.80	0.00	0.0
4445	4452	4500	4466	-1.10	14.00	49.5
4418	4421	4477	4439	-1.37	24.00	84.9
4390	4386	4447	4408	-1.68	34.00	120.3
4356	4352	4416	4375	-2.01	40.00	141.5
4321	4315	4383	4340	-2.36	47.00	166.2
4290	4280	4353	4308	-2.68	56.00	198.1
4361	4348	4448	4386	-1.90	0.00	0.0
4334	4319	4421	4358	-2.17	8.00	28.3
4306	4282	4395	4328	-2.48	17.00	60.1
4278	4244	4370	4297	-2.78	27.00	95.5
4247	4214	4343	4268	-3.07	36.00	127.3
4217	4182	4321	4240	-3.35	48.00	169.8
4185	4156	4293	4211	-3.64	60.00	212.2
4270	4279	4370	4306	-2.69	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	145	kPa
Modulus of subgrade reaction (k) =	116	MPa/m
Equivalent 762 mm plate reaction =	93	MPa/m
Equivalent CBR =	24.9	%
Surface Stiffness Modulus (E) =	138	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	138	kPa
Modulus of subgrade reaction (k) =	111	MPa/m
Equivalent 762 mm plate reaction =	89	MPa/m
Equivalent CBR =	23.1	%
Surface Stiffness Modulus (E) =	131	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 13-Sep-22

MURRAY RIX

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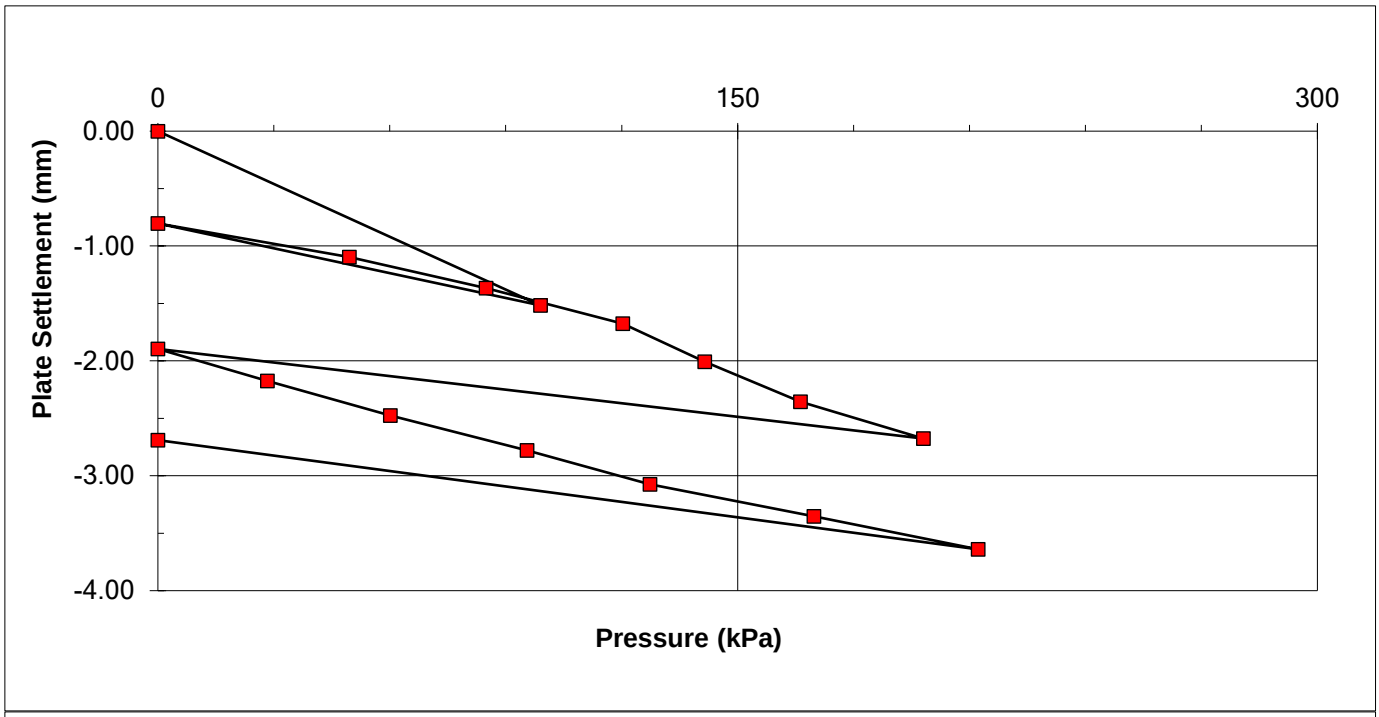
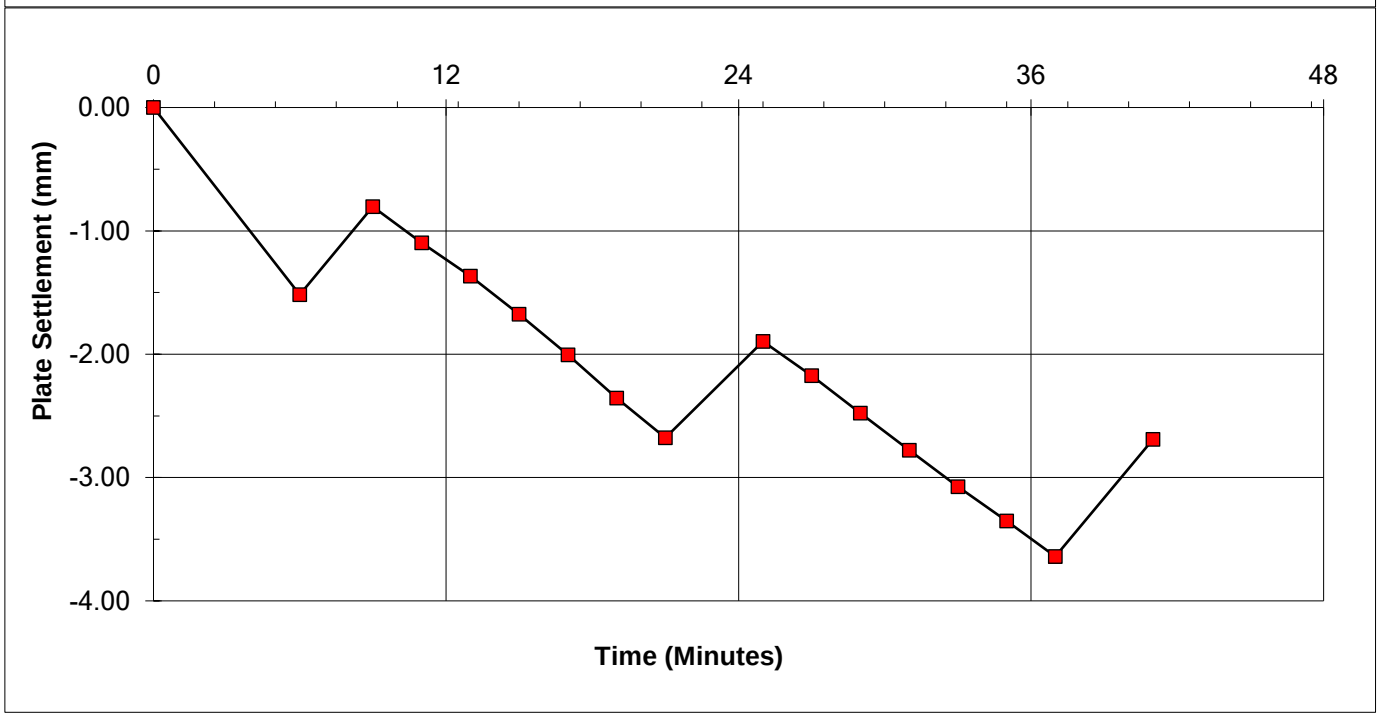
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS

Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

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Address Whaley Road
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TEST CERTIFICATE

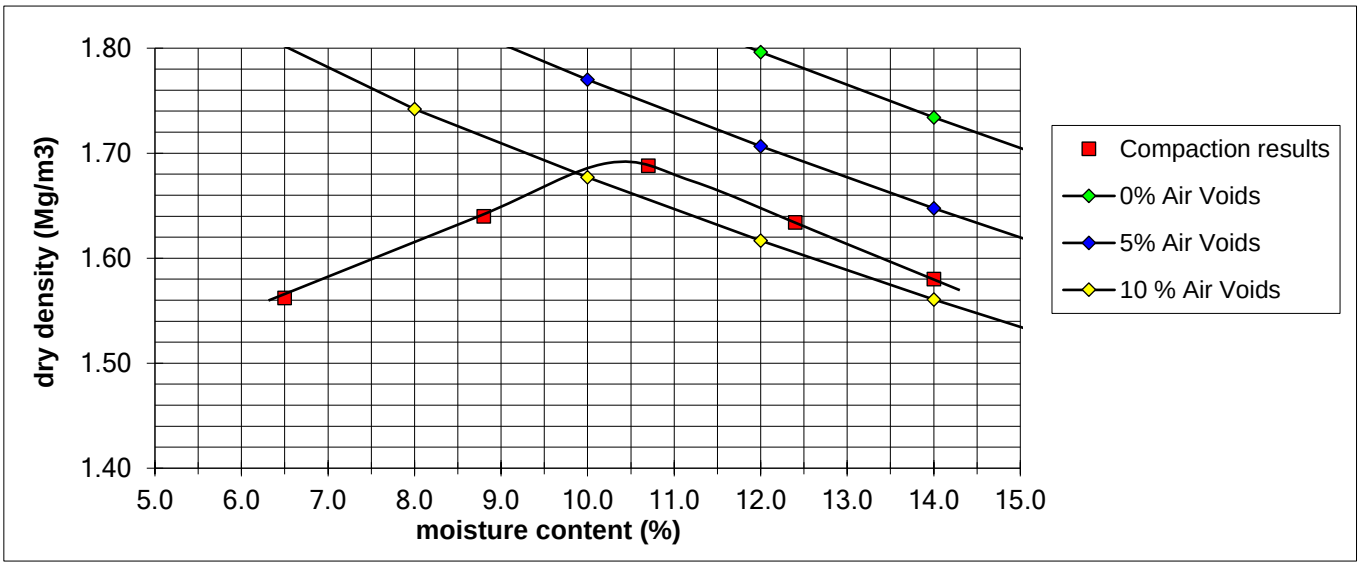
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55

SAMPLE LABEL	L3 D10	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116364	DATE RECEIVED	01-Sep-22
DATE TESTED	02-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		6.5	1.562
2		8.8	1.640
3		10.7	1.688
4		12.4	1.634
5		14.0	1.580
	Optimum	10.0	
	Maximum		1.69
	Particle Density	2.29 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 10%
Percentage of material retained on 20mm sieve = 28%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Sep-22

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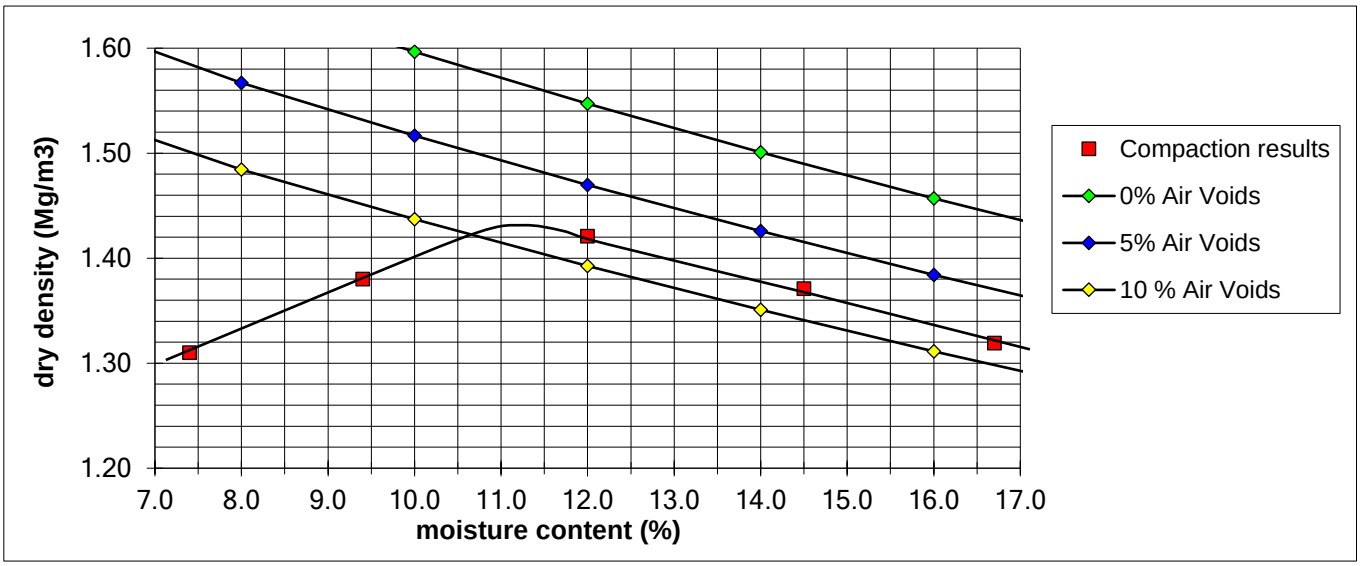
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55

SAMPLE LABEL	L2 C9	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116365	DATE RECEIVED	01-Sep-22
DATE TESTED	02-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		7.4	1.310
2		9.4	1.380
3		12.0	1.421
4		14.5	1.371
5		16.7	1.319
	Optimum	11.0	
	Maximum		1.43
	Particle Density	1.90 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 3%
Percentage of material retained on 20mm sieve = 15%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Sep-22

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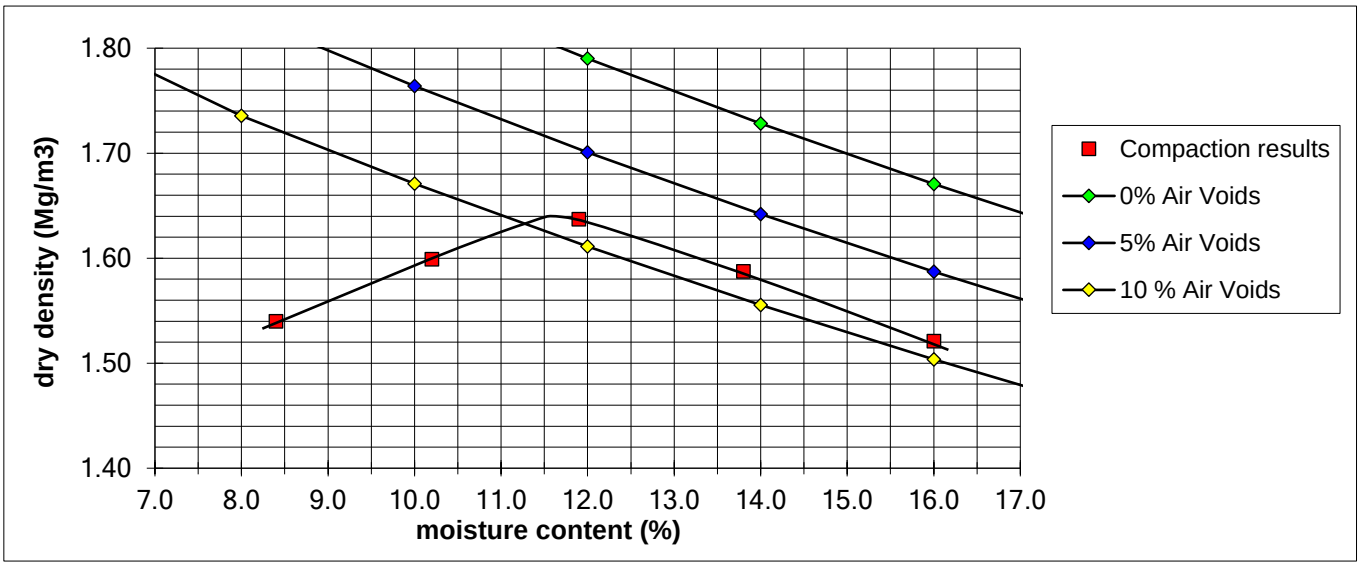
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55

SAMPLE LABEL	L4 E11	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116366	DATE RECEIVED	01-Sep-22
DATE TESTED	02-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	8.4	1.540
2	10.2	1.599
3	11.9	1.637
4	13.8	1.587
5	16.0	1.521
Optimum	12.0	
Maximum		1.64
Particle Density	2.28 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 11%
Percentage of material retained on 20mm sieve = 31%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Sep-22

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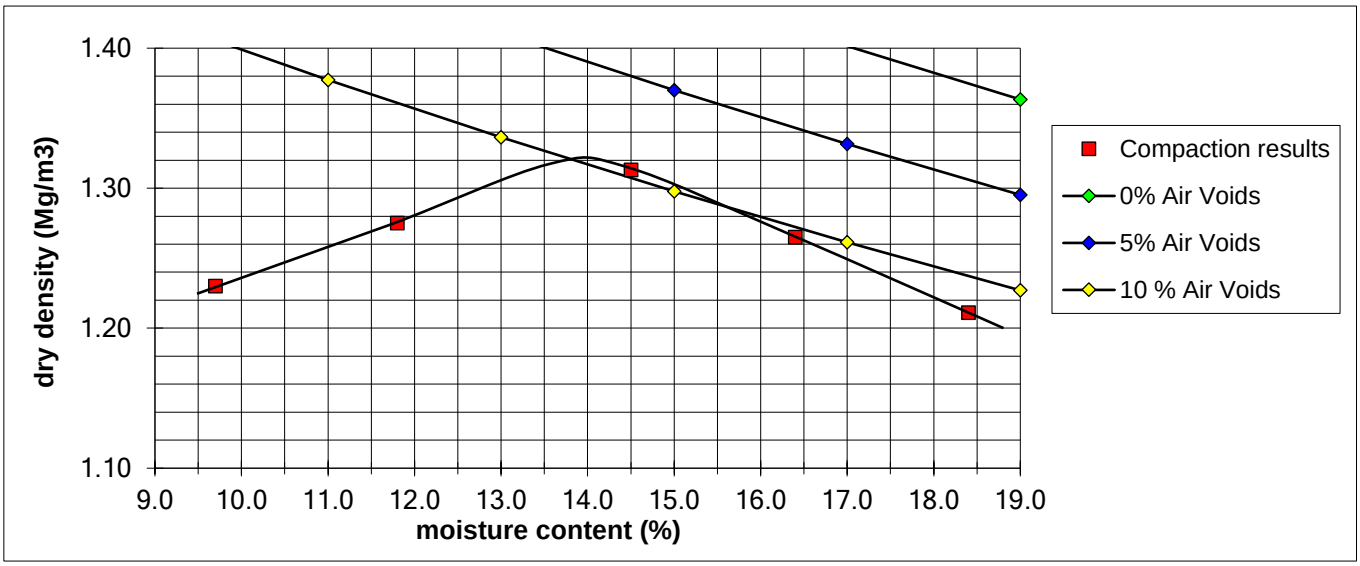
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55

SAMPLE LABEL	L5 D11	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116367	DATE RECEIVED	01-Sep-22
DATE TESTED	02-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	9.7	1.230
2	11.8	1.275
3	14.5	1.313
4	16.4	1.265
5	18.4	1.211
Optimum	14.0	
Maximum		1.32
Particle Density	1.84 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 2%
Percentage of material retained on 20mm sieve = 11%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Sep-22

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CONSTRUCTION MATERIALS TESTING

TEST REPORT

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Address Whaley Road
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Job Number MRN 4454/55A
Date of Issue 23 September 2022
Page 1 of 5

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

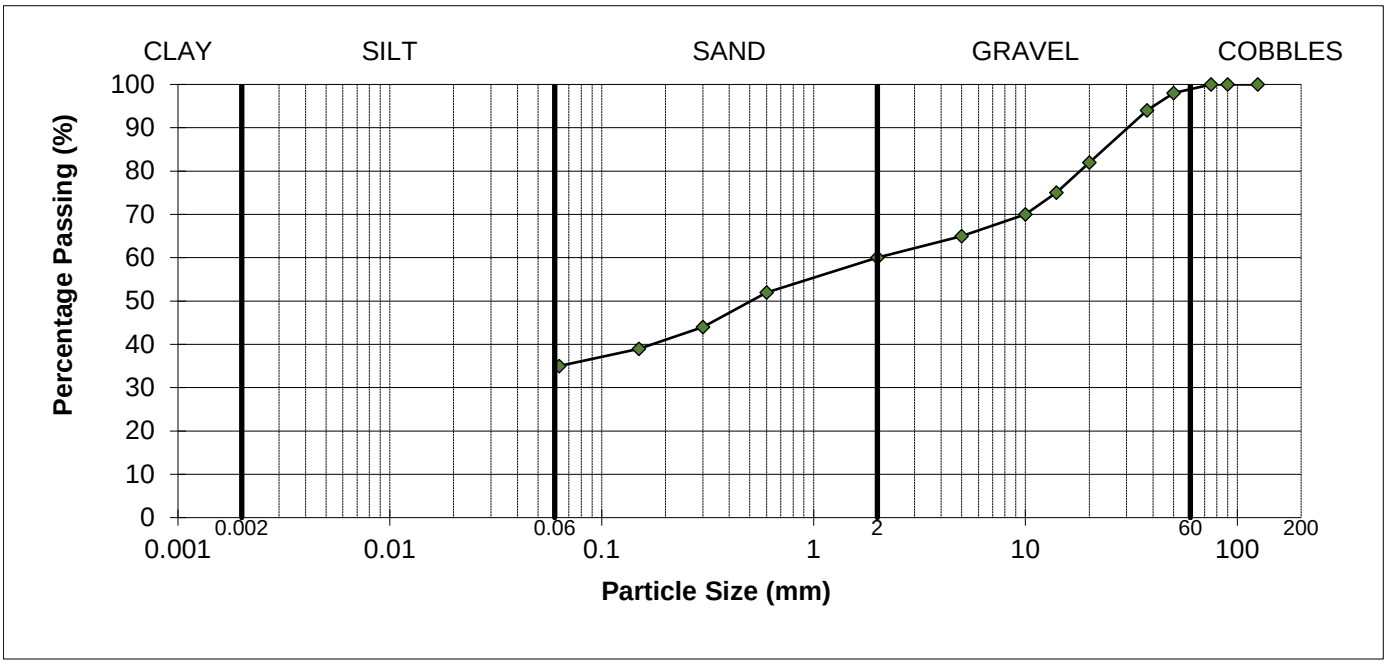
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55A

SAMPLE LABEL	L3 D10	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116364	DATE RECEIVED	01-Sep-22
DATE TESTED	13-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	70	
90	100		5	65	
75	100		2	60	
50	98		0.6	52	
37.5	94		0.3	44	
20	82		0.15	39	
14	75		0.063	35	



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 23-Sep-22

M U R R A Y R I X

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UKAS TESTING 1580

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PARTICLE SIZE DISTRIBUTION

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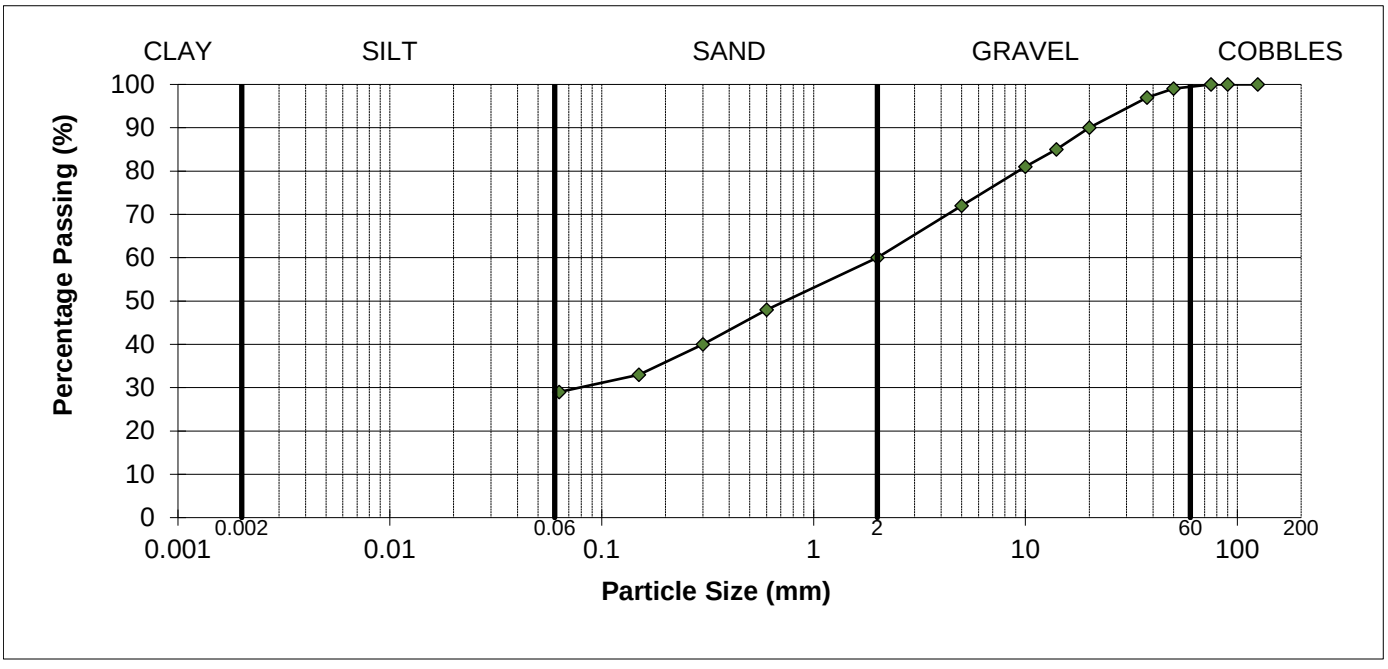
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55A

SAMPLE LABEL	L2 C9	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116365	DATE RECEIVED	01-Sep-22
DATE TESTED	13-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	81	
90	100		5	72	
75	100		2	60	
50	99		0.6	48	
37.5	97		0.3	40	
20	90		0.15	33	
14	85		0.063	29	



REMARKS

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PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

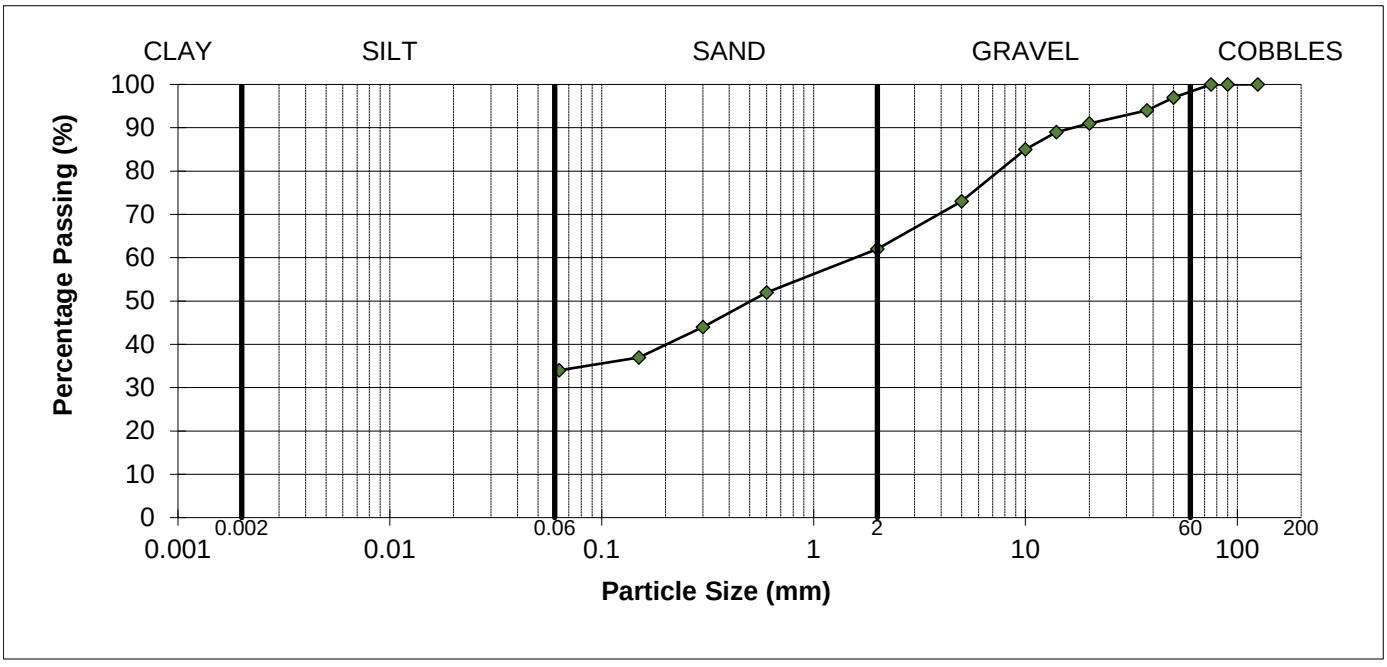
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55A

SAMPLE LABEL	L4 E11	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116366	DATE RECEIVED	01-Sep-22
DATE TESTED	13-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	85	
90	100		5	73	
75	100		2	62	
50	97		0.6	52	
37.5	94		0.3	44	
20	91		0.15	37	
14	89		0.063	34	



REMARKS

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PARTICLE SIZE DISTRIBUTION

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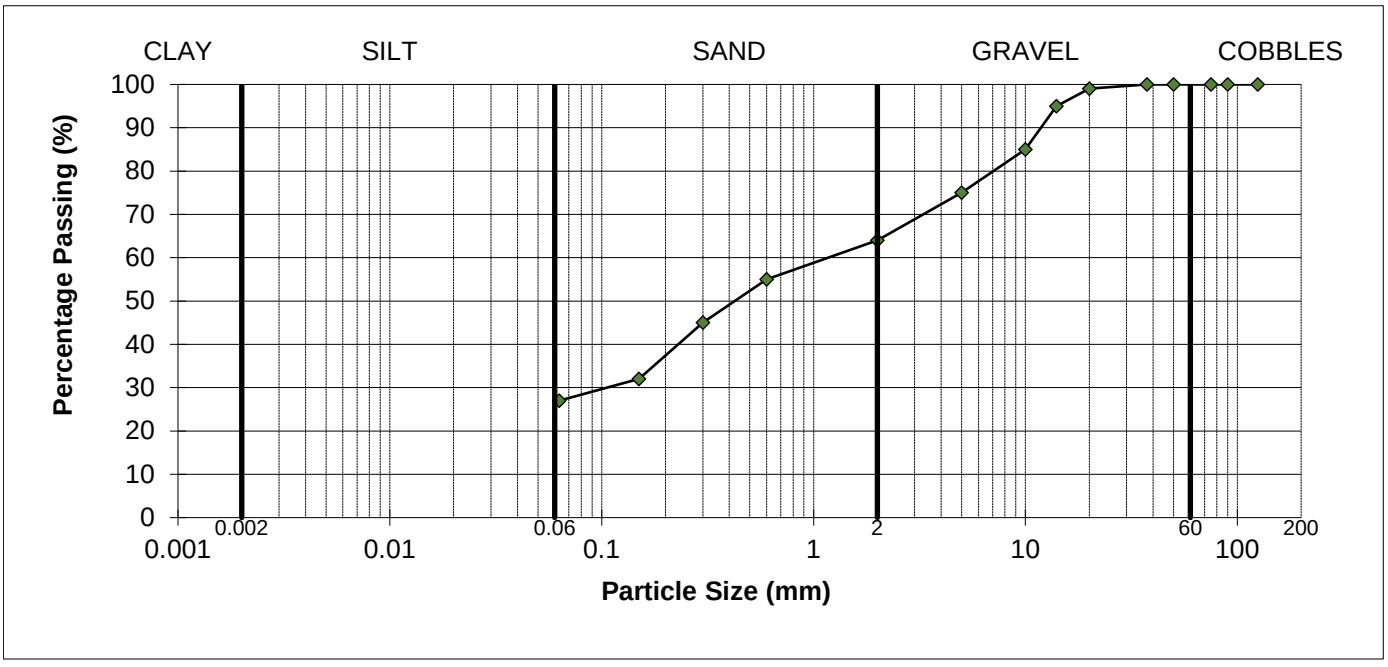
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/55A

SAMPLE LABEL	L5 D11	DATE SAMPLED	01-Sep-22
LAB SAMPLE No	116367	DATE RECEIVED	01-Sep-22
DATE TESTED	13-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	85	
90	100		5	75	
75	100		2	64	
50	100		0.6	55	
37.5	100		0.3	45	
20	99		0.15	32	
14	95		0.063	27	



REMARKS

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Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/56
Date of Issue 14 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc				
SITE	Stopes Road, Bolton				
JOB NUMBER	MRN 4454/56				
TEST LOCATION	Test 01 - E10 L11	LOADING DEVICE	20 Tonne Enerpac Jack		
TEST DATE	13-Sep-22	PLATE SIZE (mm)	600 diameter		
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant		
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required		

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4567	4583	4560	4570	0.00	0.00	0.0
4412	4435	4439	4429	-1.41	18.00	63.7
4475	4468	4493	4479	-0.91	0.00	0.0
4448	4441	4468	4452	-1.18	10.00	35.4
4417	4416	4443	4425	-1.45	18.00	63.7
4388	4386	4419	4398	-1.72	24.00	84.9
4361	4362	4395	4373	-1.97	32.00	113.2
4329	4332	4367	4343	-2.27	40.00	141.5
4294	4308	4339	4314	-2.56	60.00	212.2
4489	4457	4480	4475	-0.95	0.00	0.0
4448	4433	4453	4445	-1.25	3.00	10.6
4421	4411	4426	4419	-1.51	6.00	21.2
4394	4393	4399	4395	-1.75	10.00	35.4
4358	4367	4370	4365	-2.05	28.00	99.0
4323	4342	4342	4336	-2.34	41.00	145.0
4290	4313	4295	4299	-2.71	63.00	222.8
4452	4423	4414	4430	-1.40	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	131	kPa
Modulus of subgrade reaction (k) =	105	MPa/m
Equivalent 762 mm plate reaction =	84	MPa/m
Equivalent CBR =	21.0	%
Surface Stiffness Modulus (E) =	124	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	122	kPa
Modulus of subgrade reaction (k) =	98	MPa/m
Equivalent 762 mm plate reaction =	79	MPa/m
Equivalent CBR =	18.6	%
Surface Stiffness Modulus (E) =	114	MN/m^2

Surface Stiffness Modulus Ratio =	0.9

DATE 14-Sep-22

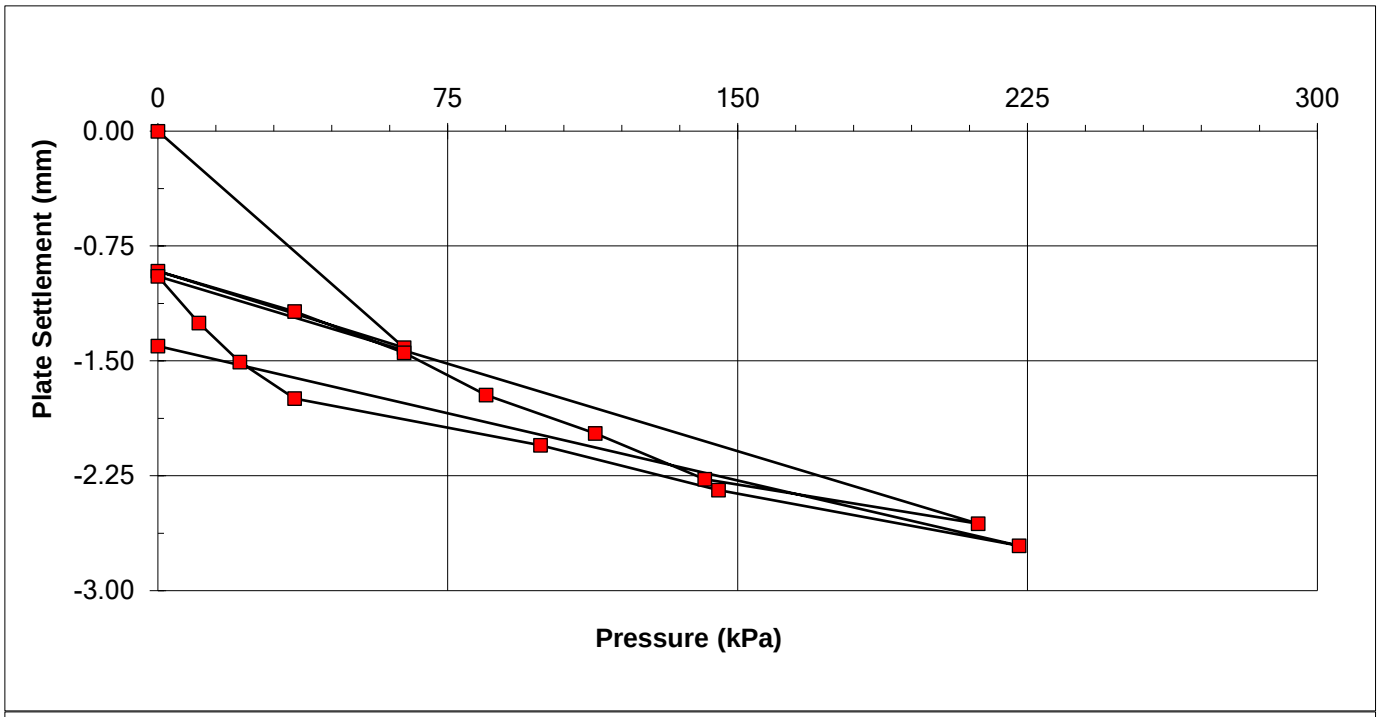
MURRAY RIX

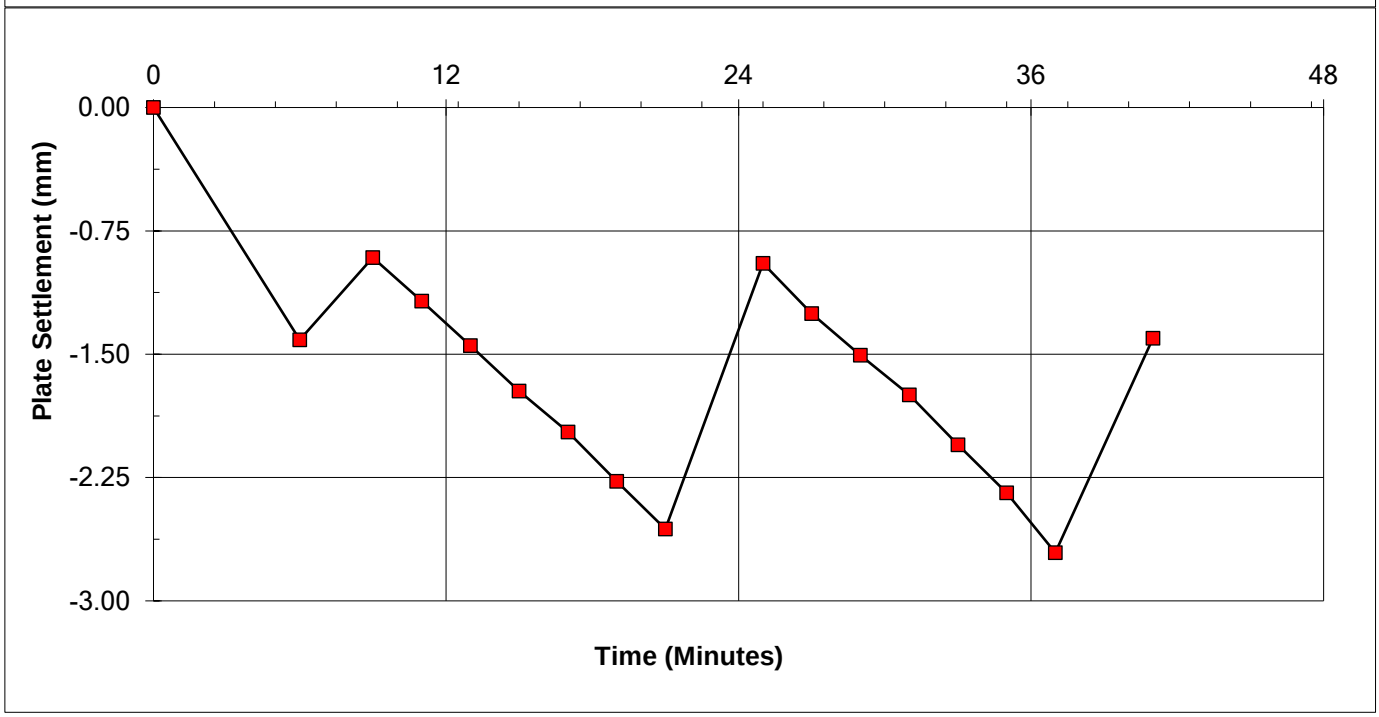
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 14-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/57
Date of Issue 15 September 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	14-Sep-22	**JOB NUMBER**	MRN 4454/57
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C9 L11	225	1.84	1.64	12	97.2	-8.5
2	E10 L11	225	1.82	1.61	13	95.3	-8.7
3	D10 L11	225	1.85	1.64	13	96.8	-6.8
4	D11 L11	225	1.86	1.69	10	99.9	-9.1
5	C7 L3	225	1.88	1.66	13	98.3	-5.1
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.69	(Advised by client)	
				Particle Density (Mg/m3)	2.29	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/57

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	14/09/2022
DATE OF TEST	14/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	15/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116654	SRD ~~O9 L10~~ D9 L10	Black Ash/Sand	1.86	1.64	13	97.0	7.1
116655	SRD D8 L9	Black Ash/Sand	1.90	1.64	16	96.9	2.3
116656	SRD C9 L11	Black Ash/Sand	1.95	1.76	11	103.9	4.0
		Maximum Dry Density (Mg/m^3)		1.69		(Advised by client)	
		Particle Density (Mg/m^3)		2.29		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 12-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/57			
TEST LOCATION	Test 01 - D14 L5	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	14-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4724	4610	4655	4663	0.00	0.00	0.0
4590	4446	4518	4518	-1.45	20.00	70.7
4626	4515	4544	4562	-1.01	0.00	0.0
4593	4489	4513	4532	-1.31	8.00	28.3
4566	4460	4486	4504	-1.59	14.00	49.5
4531	4428	4465	4475	-1.88	23.00	81.3
4503	4400	4438	4447	-2.16	30.00	106.1
4477	4368	4411	4419	-2.44	38.00	134.4
4448	4337	4384	4390	-2.73	46.00	162.7
4557	4441	4476	4491	-1.72	0.00	0.0
4530	4423	4455	4469	-1.94	8.00	28.3
4504	4395	4432	4444	-2.19	17.00	60.1
4475	4366	4411	4417	-2.46	26.00	92.0
4451	4340	4387	4393	-2.70	38.00	134.4
4423	4308	4363	4365	-2.98	50.00	176.8
4387	4272	4333	4331	-3.32	61.00	215.7
4508	4405	4424	4446	-2.17	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	116	kPa
Modulus of subgrade reaction (k) =	93	MPa/m
Equivalent 762 mm plate reaction =	75	MPa/m
Equivalent CBR =	17.1	%
Surface Stiffness Modulus (E) =	108	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	174	kPa
Modulus of subgrade reaction (k) =	139	MPa/m
Equivalent 762 mm plate reaction =	112	MPa/m
Equivalent CBR =	34.4	%
Surface Stiffness Modulus (E) =	169	MN/m^2

Surface Stiffness Modulus Ratio =	1.6

DATE 15-Sep-22

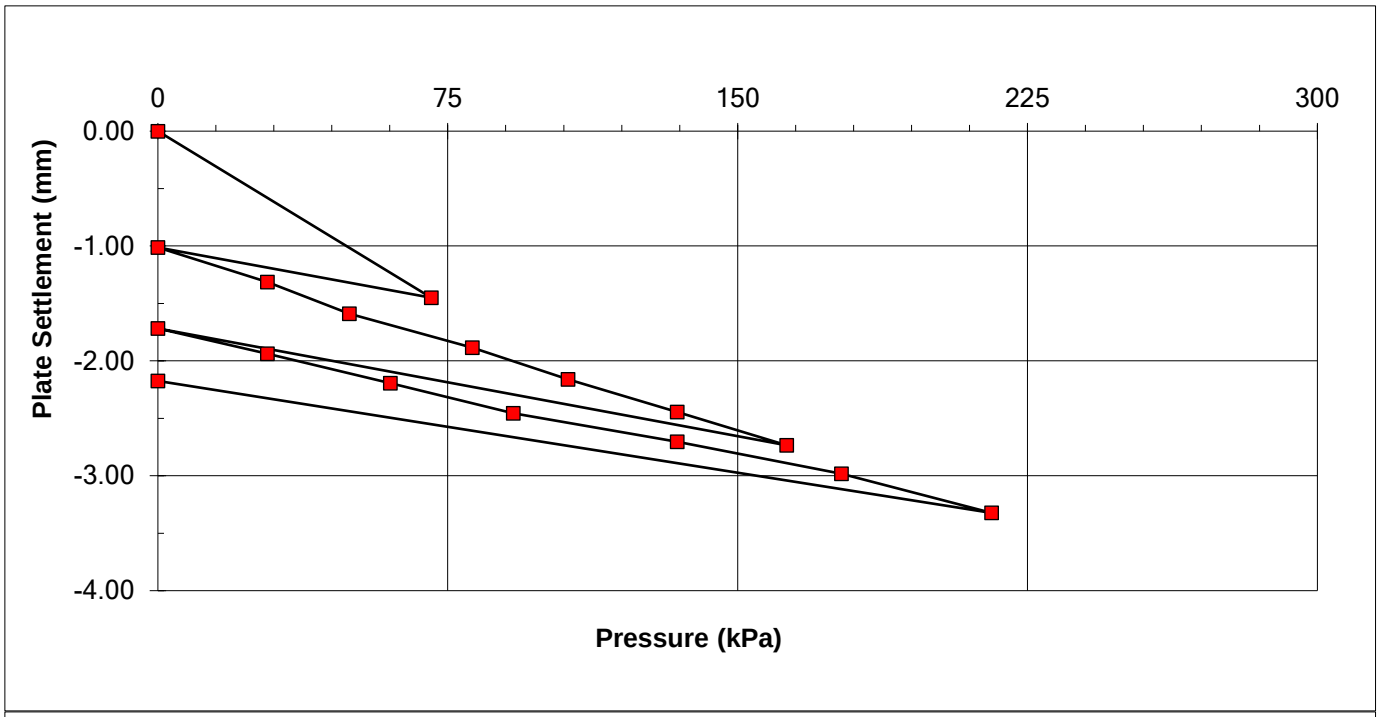
MURRAY RIX

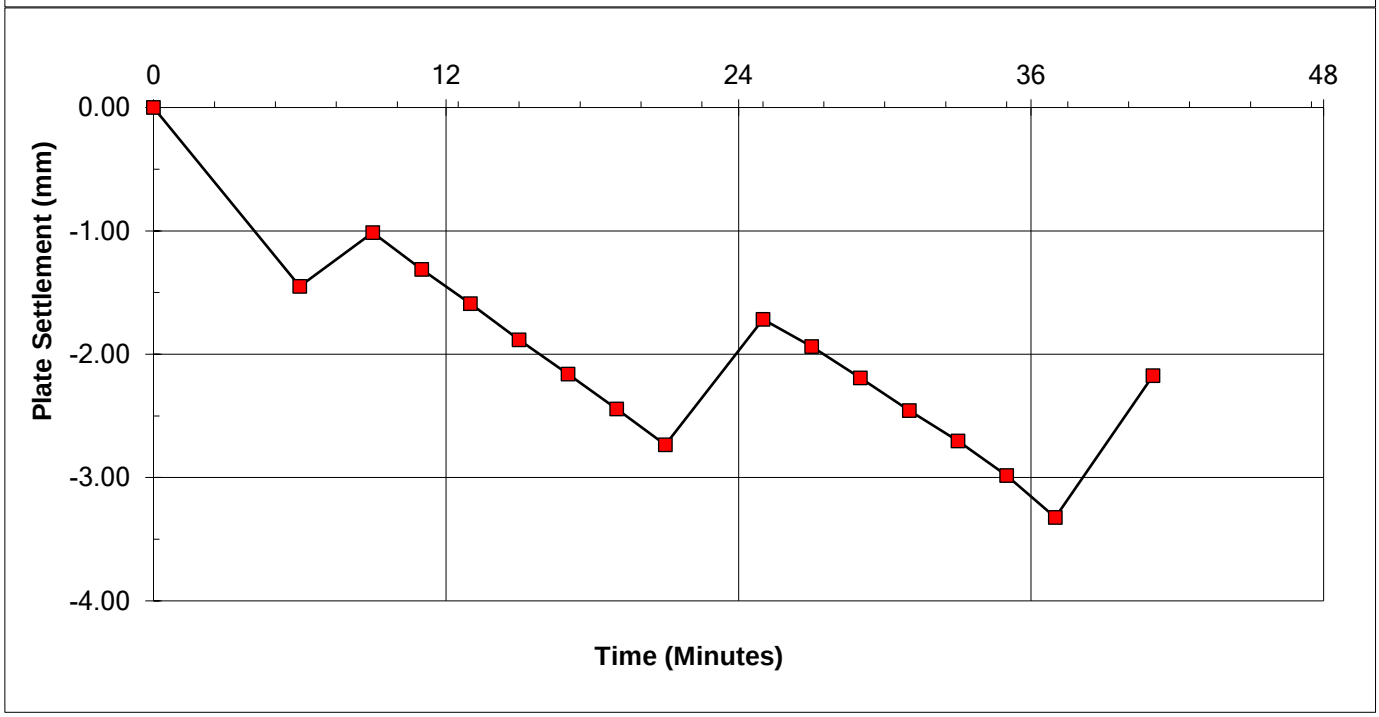
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 15-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/58
Date of Issue 16 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/58			
TEST LOCATION	Test 01 - B17 L4	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	15-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4879	4860	4910	4883	0.00	0.00	0.0
4726	4718	4785	4743	-1.40	7.00	24.8
4758	4763	4855	4792	-0.91	0.00	0.0
4727	4734	4831	4764	-1.19	5.00	17.7
4696	4706	4800	4734	-1.49	9.00	31.8
4661	4674	4768	4701	-1.82	13.00	46.0
4626	4645	4739	4670	-2.13	16.00	56.6
4590	4612	4696	4633	-2.50	18.00	63.7
4533	4564	4648	4582	-3.01	20.00	70.7
4612	4635	4748	4665	-2.18	0.00	0.0
4588	4613	4726	4642	-2.41	3.00	10.6
4560	4588	4703	4617	-2.66	8.00	28.3
4530	4565	4670	4588	-2.95	10.00	35.4
4497	4540	4643	4560	-3.23	14.00	49.5
4466	4516	4618	4533	-3.50	18.00	63.7
4436	4487	4587	4503	-3.80	20.00	70.7
4538	4578	4695	4604	-2.79	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	49	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	60	kPa
Modulus of subgrade reaction (k) =	48	MPa/m
Equivalent 762 mm plate reaction =	39	MPa/m
Equivalent CBR =	5.4	%
Surface Stiffness Modulus (E) =	52	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 16-Sep-22

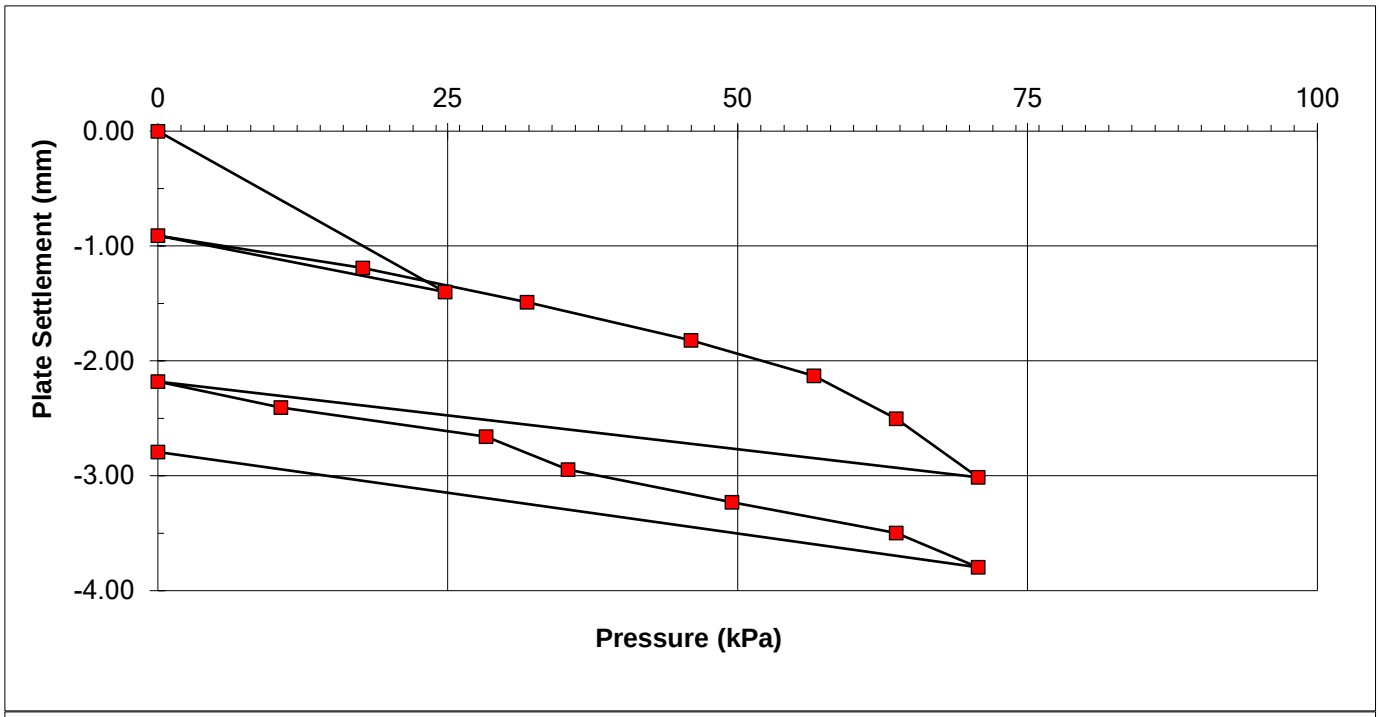
MURRAY RIX

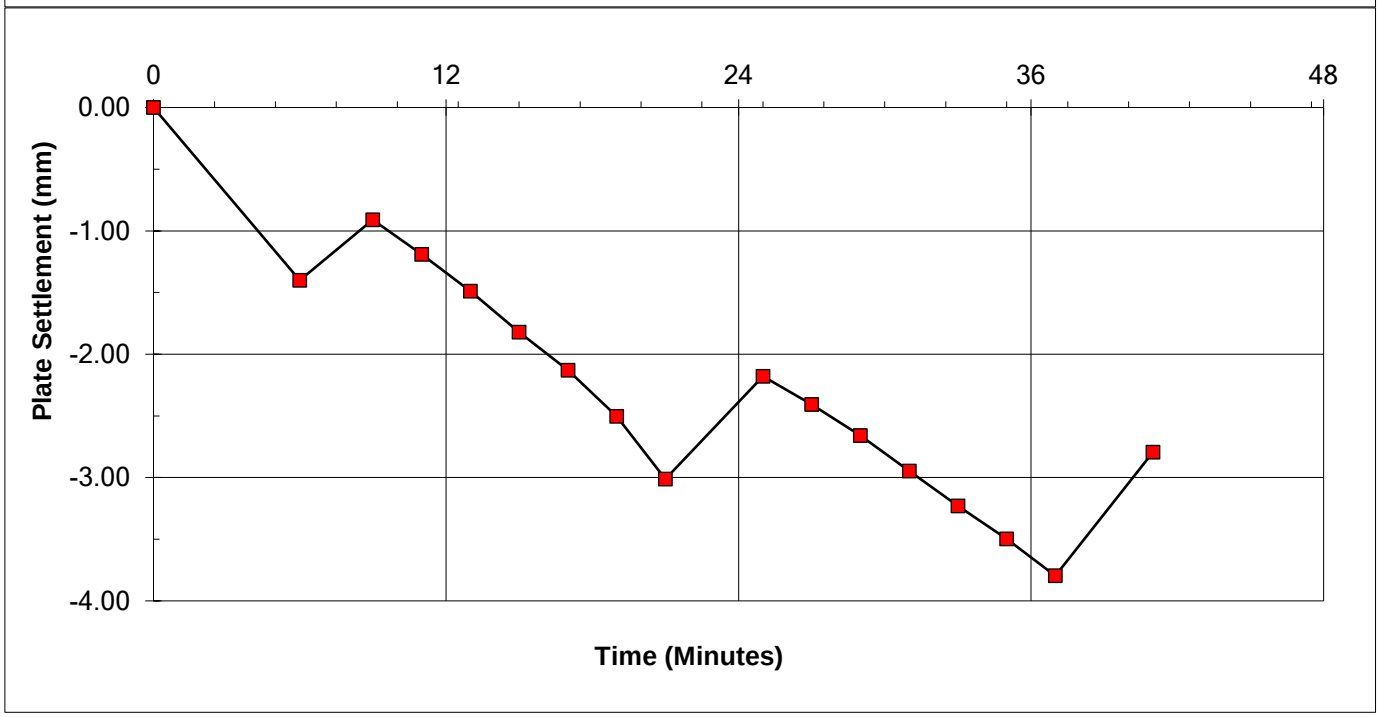
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 16-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	Stopes Road, Bolton			
JOB NUMBER	MRN 4454/58			
TEST LOCATION	Test 02 - C16 L4	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	15-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4755	4811	4803	4790	0.00	0.00	0.0
4597	4675	4637	4636	-1.53	11.00	38.9
4631	4723	4679	4678	-1.12	0.00	0.0
4604	4700	4646	4650	-1.40	8.00	28.3
4577	4673	4617	4622	-1.67	11.00	38.9
4548	4650	4582	4593	-1.96	15.00	53.1
4518	4625	4547	4563	-2.26	19.00	67.2
4484	4591	4500	4525	-2.65	22.00	77.8
4447	4566	4470	4494	-2.95	25.00	88.4
4536	4639	4577	4584	-2.06	0.00	0.0
4506	4617	4550	4558	-2.32	6.00	21.2
4479	4591	4524	4531	-2.58	10.00	35.4
4448	4567	4490	4502	-2.88	15.00	53.1
4417	4541	4462	4473	-3.16	20.00	70.7
4387	4514	4429	4443	-3.46	23.00	81.3
4358	4490	4398	4415	-3.74	27.00	95.5
4483	4593	4549	4542	-2.48	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	70	kPa
Modulus of subgrade reaction (k) =	56	MPa/m
Equivalent 762 mm plate reaction =	45	MPa/m
Equivalent CBR =	7.1	%
Surface Stiffness Modulus (E) =	62	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	76	kPa
Modulus of subgrade reaction (k) =	61	MPa/m
Equivalent 762 mm plate reaction =	49	MPa/m
Equivalent CBR =	8.1	%
Surface Stiffness Modulus (E) =	67	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 16-Sep-22

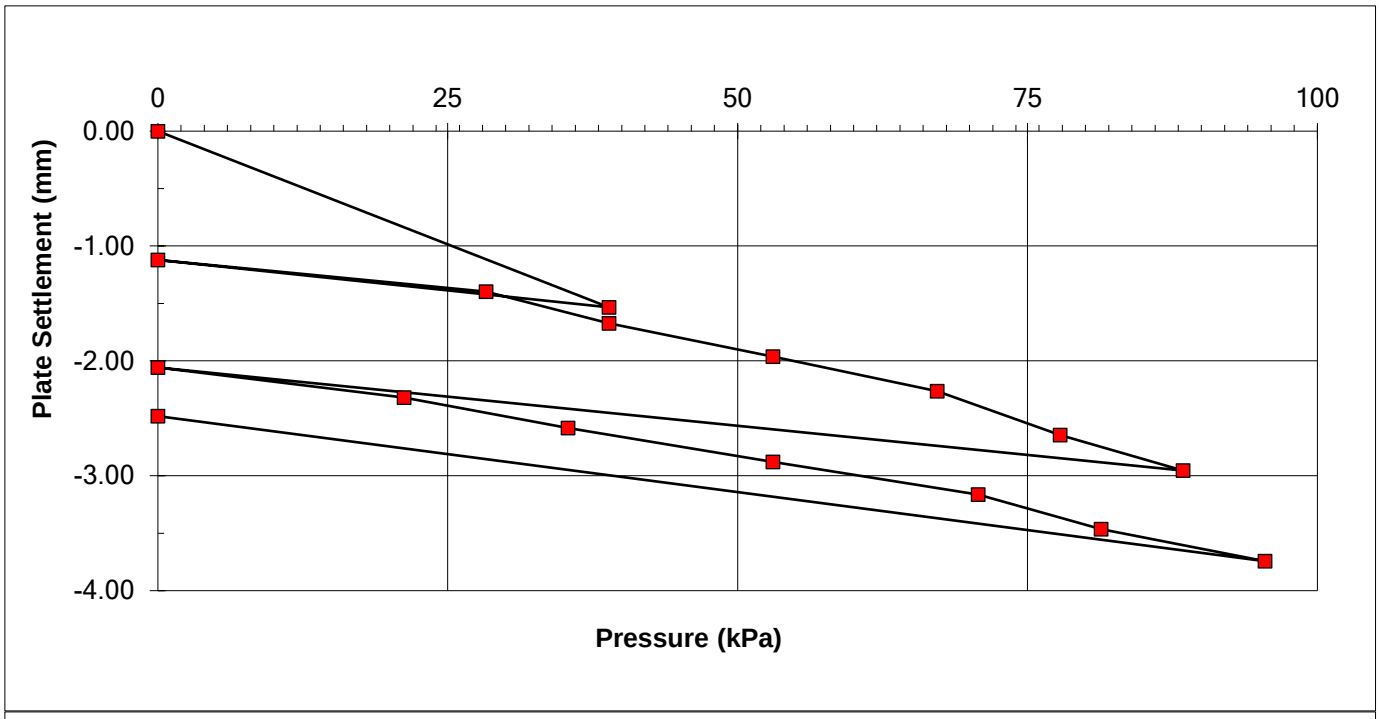
MURRAY RIX

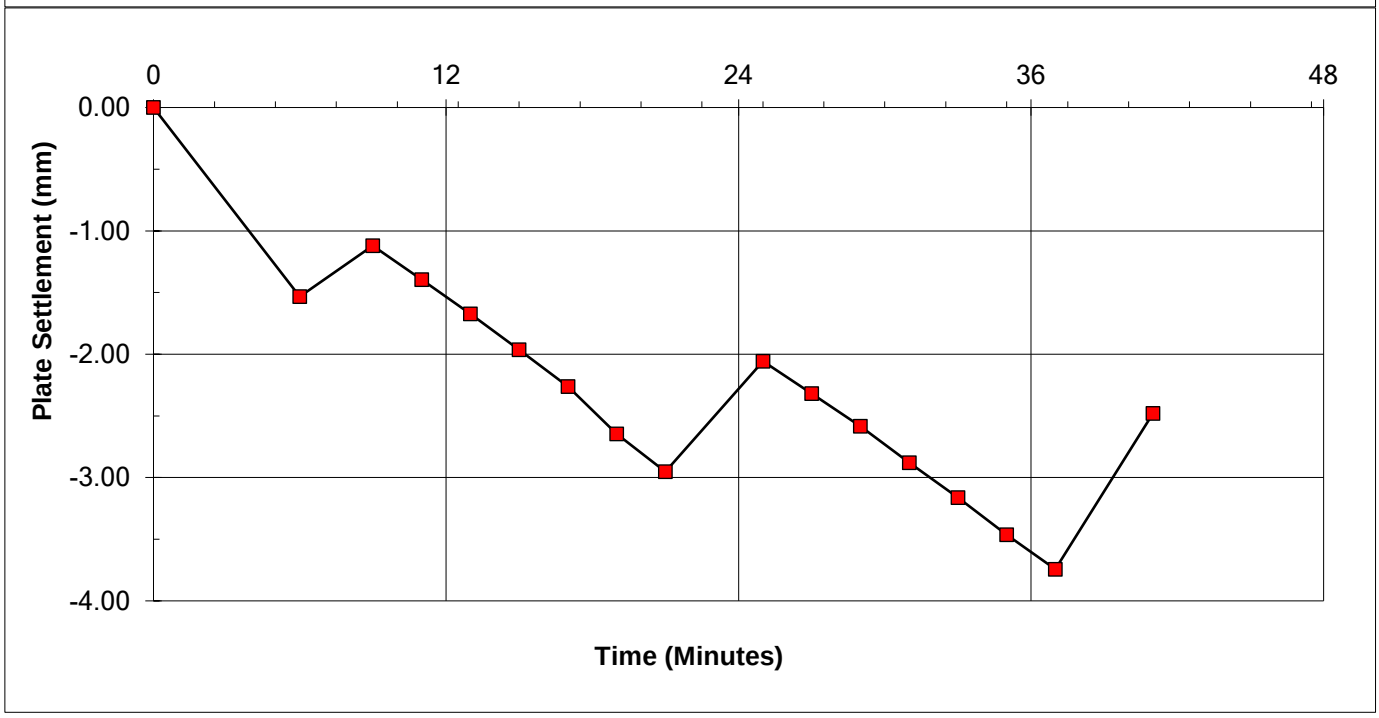
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 16-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/59
Date of Issue 20 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	16-Sep-22	**JOB NUMBER**	MRN 4454/59
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	A17 L5	225	1.88	1.74	8.2	102.8	9.9
2	A17 L4	225	1.90	1.70	12	100.6	5.8
3	A16 L5	225	1.87	1.69	11	100.1	8.3
4	A16 L4	225	1.94	1.75	11	103.7	5.0
5	A15 L5	225	1.87	1.69	11	99.8	8.0
6	A15 L4	225	1.88	1.71	10	101.1	8.3
7	B15 L5	225	1.91	1.74	10	103.1	7.1
8	B15 L4	225	1.84	1.66	11	98.3	9.6
9	B16 L5	225	1.90	1.75	8.7	103.5	8.5
10	B16 L4	225	1.88	1.73	9.0	102.1	9.2
11	B17 L5	225	1.90	1.72	11	101.5	6.6
12	B17 L4	225	1.91	1.75	9.4	103.4	7.3
13	C17 L5	225	1.85	1.67	11	98.5	9.3
14	C17 L4	225	1.89	1.71	11	101.0	7.1
15	C16 L5	225	1.88	1.70	11	100.7	7.8
16	C16 L4	225	1.88	1.70	10	100.9	8.0
17	C15 L5	225	1.96	1.76	11	104.2	3.4
18	C15 L4	225	1.87	1.70	10	100.3	8.5
19	D16 L5	225	1.87	1.65	13	97.8	6.1
20	D16 L4	225	1.83	1.62	13	95.7	8.5
				Maximum Dry Density (Mg/m3)	1.69	(Advised by client)	
				Particle Density (Mg/m3)	2.29	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 20-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	16-Sep-22	**JOB NUMBER**	MRN 4454/59
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	D17 L5	225	1.84	1.62	14	96.0	7.1
22	D17 L4	225	1.88	1.68	12	99.3	6.4
23	C18 L5	225	1.89	1.76	7.6	103.9	9.9
24	C18 L4	225	1.88	1.73	8.6	102.4	9.5
25	C19 L5	225	1.89	1.74	8.4	103.2	9.3
26	C19 L4	225	1.94	1.77	9.5	104.8	5.9
27	D18 L5	225	1.92	1.76	9.1	104.2	7.2
28	D18 L4	225	1.87	1.69	10	100.1	8.5
29	D19 L5	225	1.86	1.69	10	100.0	9.2
30	D19 L4	225	1.85	1.67	10	99.0	9.2
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.69	(Advised by client)	
				Particle Density (Mg/m3)	2.29	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 20-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/59

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	16/09/2022
DATE OF TEST	16/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	17/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116797	SRD B15 L4	Black Ash/Sand	1.96	1.73	13	102.6	1.7
116798	SRD A17 L5	Black Ash/Sand	1.88	1.69	11	101.2	7.4
		Maximum Dry Density (Mg/m^3)		1.69		(Advised by client)	
		Particle Density (Mg/m^3)		2.29		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 20-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/60
Date of Issue 21 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

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Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	20-Sep-22	**JOB NUMBER**	MRN 4454/60
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	E20 L6	225	1.80	1.57	15	102.7	4.7
2	E19 L6	225	1.84	1.56	18	102.0	0.1
3	E18 L6	225	1.81	1.55	17	101.2	2.4
4	D20 L6	225	1.80	1.55	16	101.4	3.7
5	D19 L6	225	1.78	1.47	21	96.0	1.2
6	C19 L6	225	1.75	1.46	20	95.5	3.8
7	D18 L6	225	1.78	1.47	21	96.0	1.0
8	C18 L6	225	1.77	1.47	20	96.0	2.4
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.53	(Advised by client)
					Particle Density (Mg/m3)	2.17	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	20-Sep-22	**JOB NUMBER**	MRN 4454/60
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D17 L6	225	1.98	1.76	13	98.1	2.9
2	C17 L6	225	1.99	1.78	12	99.4	3.3
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.79	(Advised by client)	
				Particle Density (Mg/m3)	2.35	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/61
Date of Issue 23 September 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	22-Sep-22	**JOB NUMBER**	MRN 4454/61
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B16 L6	225	1.92	1.76	9.3	98.2	9.0
2	C16 L6	225	1.92	1.76	9.0	98.4	9.2
3	B15 L6	225	2.02	1.83	10	102.3	3.4
4	B17 L6	225	1.92	1.75	9.6	97.9	8.6
5	C15 L6	225	1.96	1.80	8.8	100.6	7.5
6	D16 L6	225	1.99	1.77	13	98.6	2.8
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.79	(Advised by client)	
				Particle Density (Mg/m3)	2.35	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/61		
TEST LOCATION	E20 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	22-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4489	4540	4628	4552	0.00	0.00	0.0
4400	4472	4581	4484	-0.68	5.00	17.7
4435	4503	4588	4509	-0.44	0.00	0.0
4416	4476	4551	4481	-0.71	2.00	7.1
4371	4457	4534	4454	-0.98	7.00	24.8
4340	4435	4504	4426	-1.26	10.00	35.4
4321	4417	4491	4410	-1.43	13.00	46.0
4318	4384	4460	4387	-1.65	16.00	56.6
4285	4365	4441	4364	-1.89	19.00	67.2
4377	4389	4566	4444	-1.08	0.00	0.0
4360	4374	4540	4425	-1.28	1.00	3.5
4344	4348	4524	4405	-1.47	3.00	10.6
4324	4329	4503	4385	-1.67	8.00	28.3
4305	4306	4471	4361	-1.92	11.00	38.9
4258	4287	4434	4326	-2.26	15.00	53.1
4242	4262	4409	4304	-2.48	19.00	67.2
4304	4353	4442	4366	-1.86	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

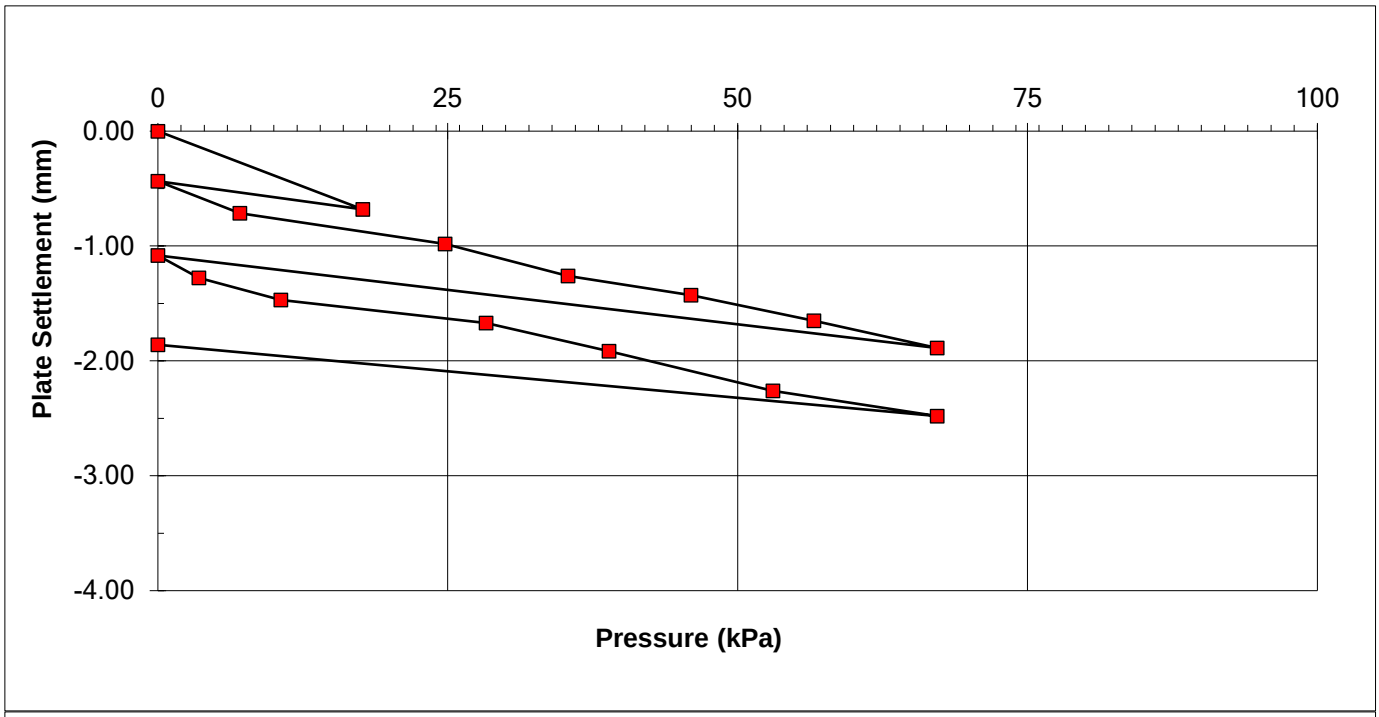
DATE 23-Sep-22

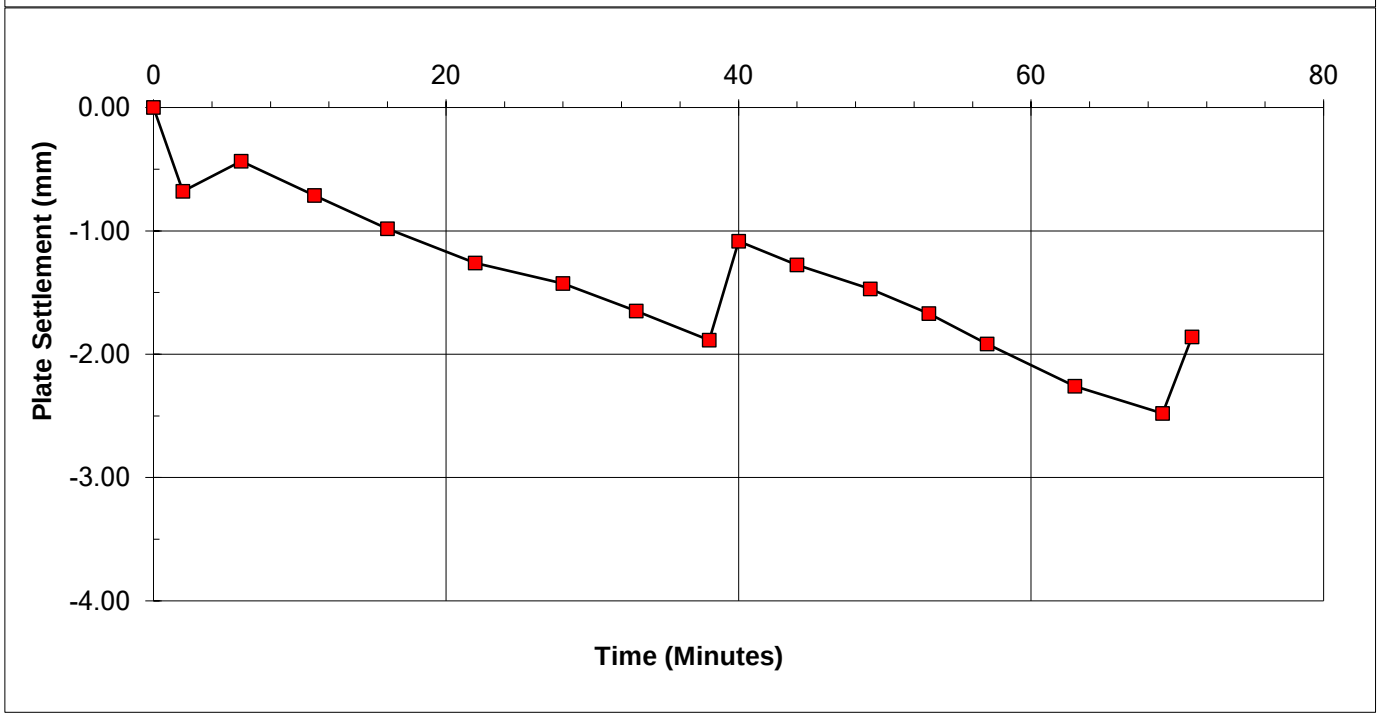
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 23-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/61

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	22/09/2022
DATE OF TEST	22/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	22/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116870	D17 L6	Black Ash/Sand	2.00	1.76	14	98.3	0.5
116871	B15 L6	Black Ash/Sand	2.07	1.85	12	103.4	-0.9
		Maximum Dry Density (Mg/m^3)		1.79		(Advised by client)	
		Particle Density (Mg/m^3)		2.35		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/62
Date of Issue 26 September 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	23-Sep-22	**JOB NUMBER**	MRN 4454/62
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B17 L7	225	1.71	1.50	14	105.8	2.6
2	B16 L7	225	1.68	1.43	18	100.7	1.2
3	B15 L7	225	1.61	1.40	15	98.7	7.2
4	A15 L6	225	1.63	1.40	17	98.6	5.1
5	A15 L7	225	1.63	1.38	18	97.4	4.7
6	A16 L6	225	1.61	1.37	17	96.8	6.0
7	A16 L7	225	1.60	1.37	17	96.4	6.7
8	A17 L6	225	1.61	1.36	18	96.1	5.7
9	A17 L7	225	1.65	1.41	17	99.6	4.2
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.42	(Advised by client)	
				Particle Density (Mg/m3)	1.95	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 26-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/62		
TEST LOCATION	D15 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	23-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4764	4722	4670	4719	0.00	0.00	0.0
4711	4676	4615	4667	-0.51	5.00	17.7
4750	4692	4654	4699	-0.20	0.00	0.0
4727	4679	4629	4678	-0.40	3.00	10.6
4696	4650	4592	4646	-0.73	6.00	21.2
4673	4633	4575	4627	-0.92	9.00	31.8
4655	4603	4565	4608	-1.11	12.00	42.4
4641	4589	4545	4592	-1.27	15.00	53.1
4592	4558	4496	4549	-1.70	18.00	63.7
4662	4651	4554	4622	-0.96	0.00	0.0
4635	4637	4532	4601	-1.17	3.00	10.6
4615	4612	4518	4582	-1.37	6.00	21.2
4603	4582	4488	4558	-1.61	9.00	31.8
4571	4575	4468	4538	-1.81	12.00	42.4
4548	4546	4442	4512	-2.07	15.00	53.1
4504	4520	4417	4480	-2.38	18.00	63.7
4604	4625	4523	4584	-1.35	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

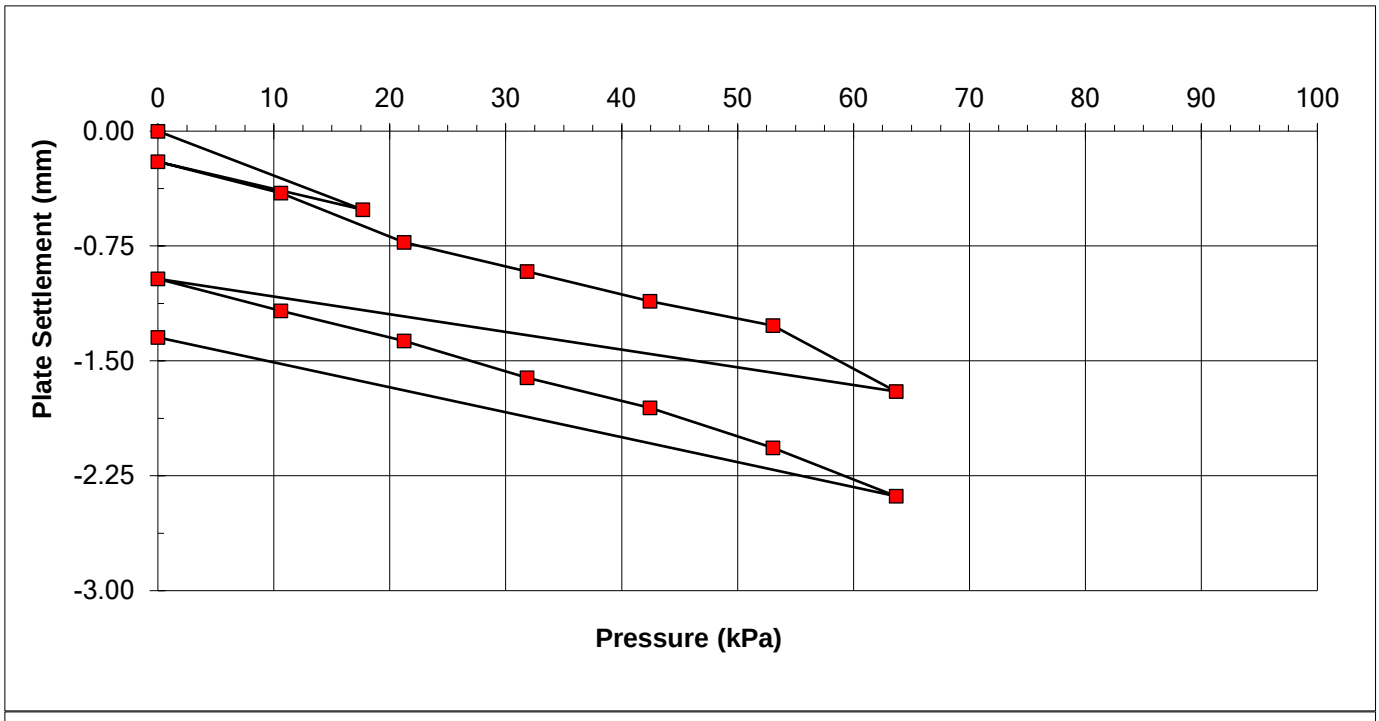
DATE 26-Sep-22

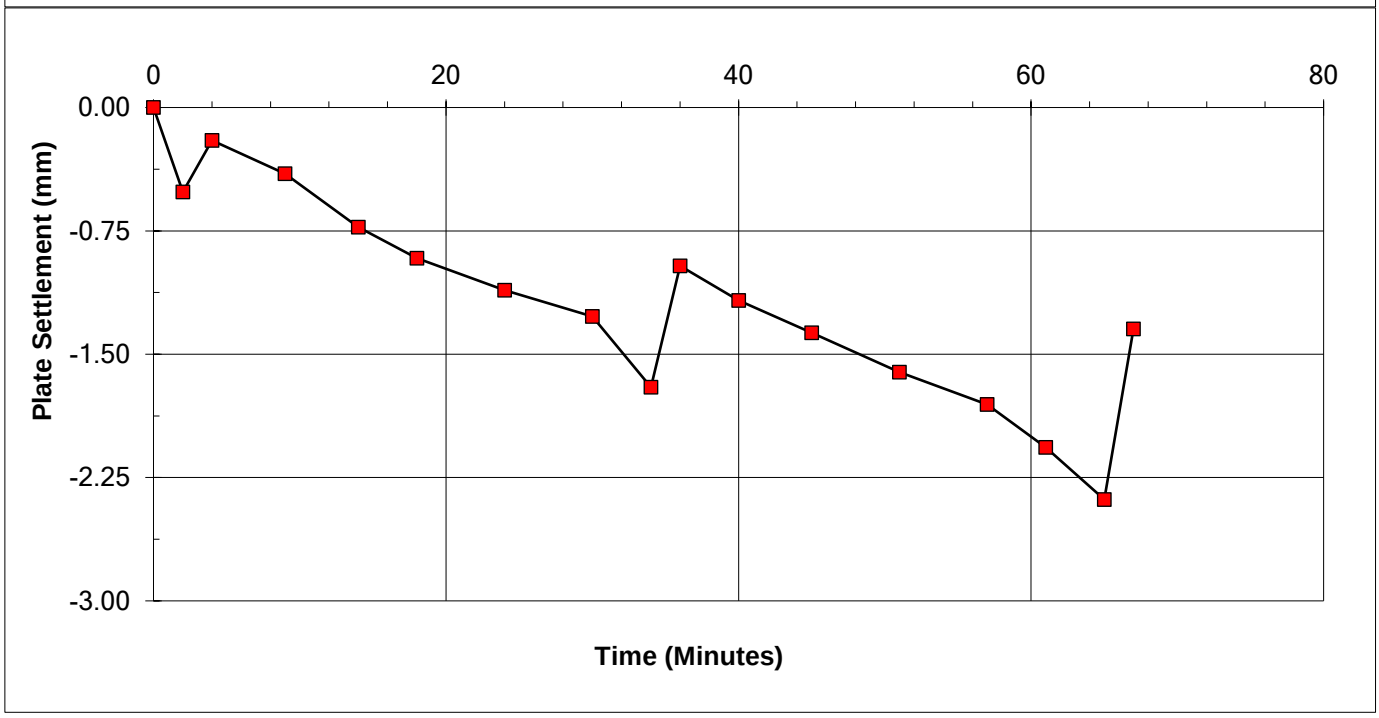
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 26-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/62		
TEST LOCATION	B18 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	23-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4790	4804	4821	4805	0.00	0.00	0.0
4731	4762	4788	4760	-0.45	5.00	17.7
4756	4770	4812	4779	-0.26	0.00	0.0
4737	4751	4795	4761	-0.44	3.00	10.6
4716	4731	4771	4739	-0.66	5.00	17.7
4696	4717	4756	4723	-0.82	8.00	28.3
4674	4698	4731	4701	-1.04	12.00	42.4
4654	4677	4719	4683	-1.22	15.00	53.1
4636	4651	4673	4653	-1.52	18.00	63.7
4661	4698	4728	4696	-1.09	0.00	0.0
4634	4672	4707	4671	-1.34	2.00	7.1
4615	4659	4688	4654	-1.51	3.00	10.6
4592	4639	4663	4631	-1.74	6.00	21.2
4556	4621	4642	4606	-1.99	12.00	42.4
4536	4591	4618	4582	-2.23	15.00	53.1
4513	4558	4593	4555	-2.50	18.00	63.7
4579	4611	4668	4619	-1.86	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	63	kPa
Modulus of subgrade reaction (k) =	51	MPa/m
Equivalent 762 mm plate reaction =	41	MPa/m
Equivalent CBR =	5.9	%
Surface Stiffness Modulus (E) =	55	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	49	MN/m^2

Surface Stiffness Modulus Ratio =	0.9

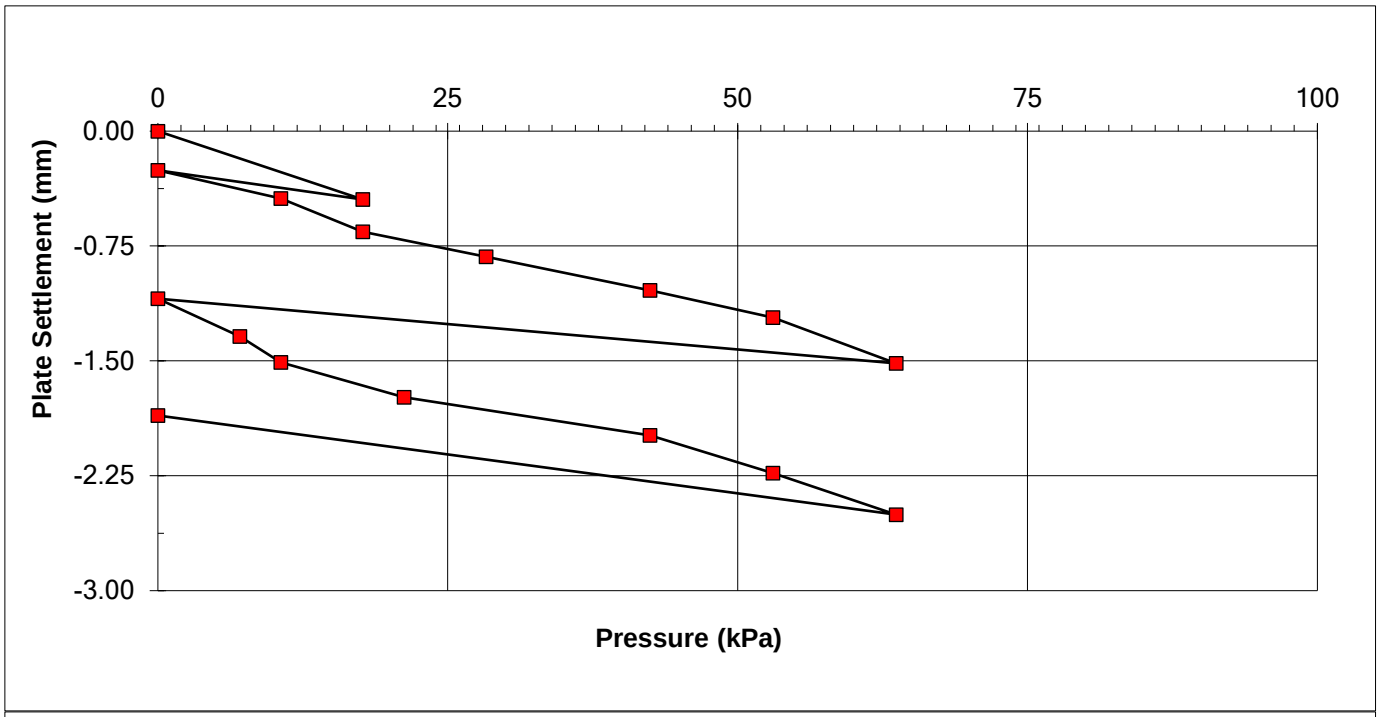
DATE 26-Sep-22

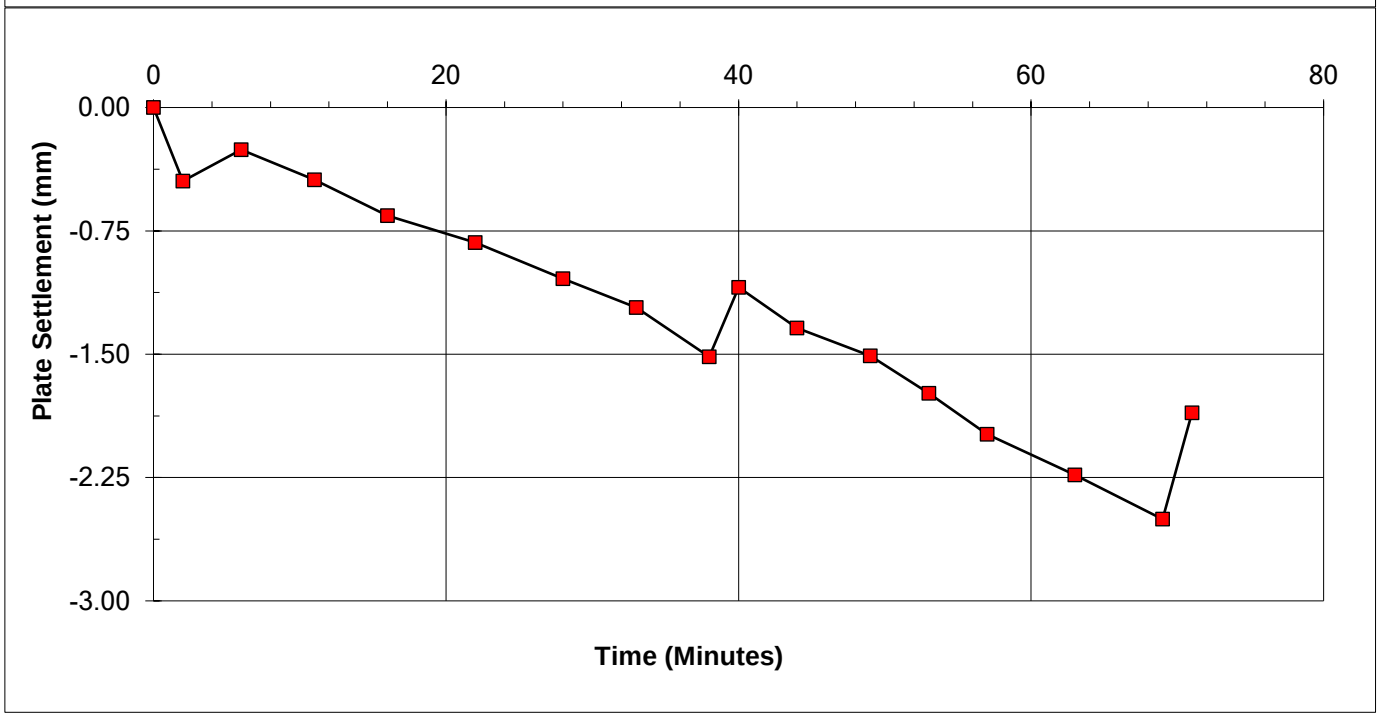
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 26-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD

BS 1377 : Part 9 : Clause 2.2

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/62

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	23/09/2022
DATE OF TEST	23/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	23/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
116974	A15 L6	Black Ash/Sand	1.62	1.41	15	99.2	6.7
		Maximum Dry Density (Mg/m^3)		1.42		(Advised by client)	
		Particle Density (Mg/m^3)		1.95		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 26-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/63
Date of Issue 28 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	27-Sep-22	**JOB NUMBER**	MRN 4454/63
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B17 L8	225	1.87	1.59	18	95.8	1.3
2	A16 L8	225	1.88	1.61	17	96.8	1.3
3	A17 L8	225	1.89	1.65	15	99.1	2.4
4	A15 L8	225	1.82	1.57	16	94.3	4.9
5	B15 L8	225	1.87	1.62	16	97.5	2.9
6	B16 L8	225	1.86	1.59	17	95.6	2.2

Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
Particle Density (Mg/m3)	2.25	(Advised by client)
Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager)

SIGNED

DATE 28-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP			
JOB NUMBER	MRN 4454/63			
TEST LOCATION	B16 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	27-Sep-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4791	4704	4821	4772	0.00	0.00	0.0
4651	4662	4658	4657	-1.15	7.00	24.8
4696	4690	4712	4699	-0.73	0.00	0.0
4657	4672	4695	4675	-0.97	3.00	10.6
4636	4651	4671	4653	-1.19	7.00	24.8
4605	4637	4656	4633	-1.39	10.00	35.4
4584	4618	4638	4613	-1.59	13.00	46.0
4562	4587	4619	4589	-1.83	15.00	53.1
4548	4561	4573	4561	-2.11	18.00	63.7
4668	4652	4628	4649	-1.23	0.00	0.0
4641	4626	4607	4625	-1.47	3.00	10.6
4622	4613	4588	4608	-1.64	5.00	17.7
4592	4593	4563	4583	-1.89	10.00	35.4
4563	4545	4549	4552	-2.20	13.00	46.0
4531	4523	4528	4527	-2.45	16.00	56.6
4490	4502	4483	4492	-2.80	19.00	67.2
4588	4565	4568	4574	-1.98	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	59	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.2	%
Surface Stiffness Modulus (E) =	51	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

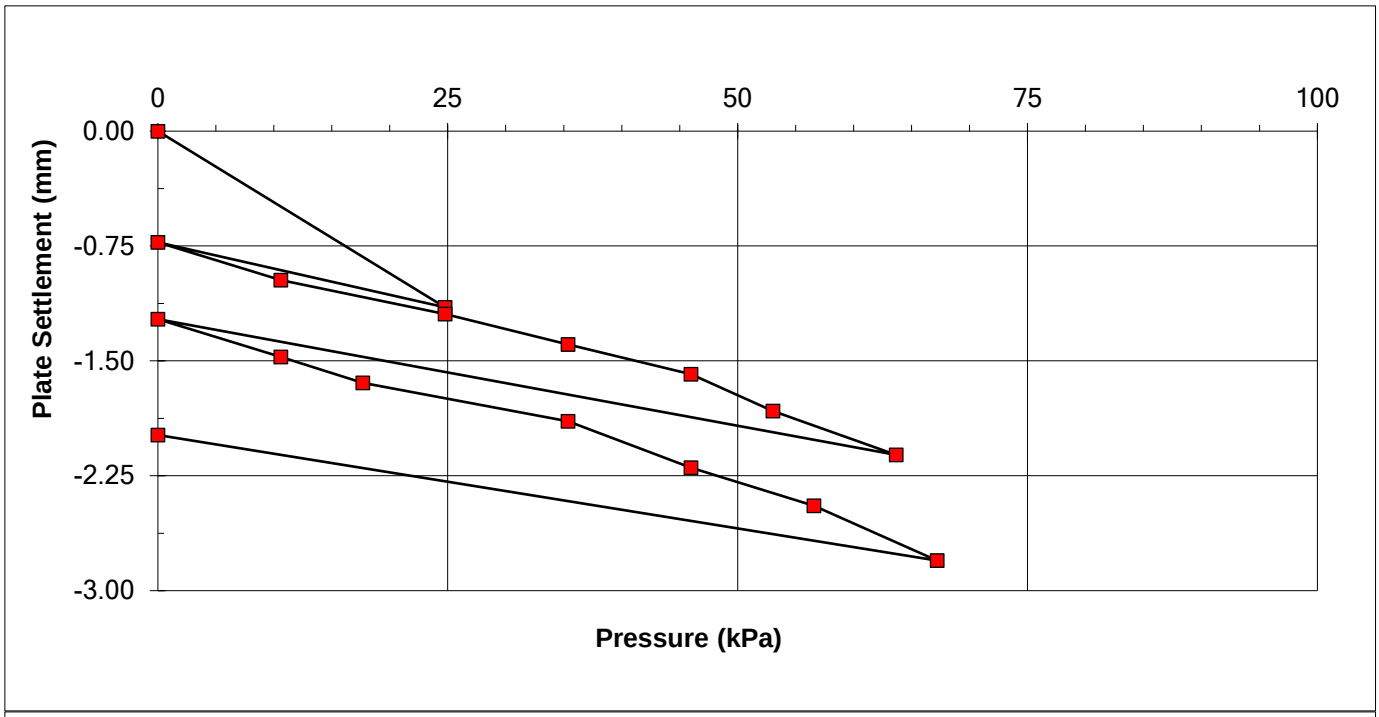
DATE 28-Sep-22

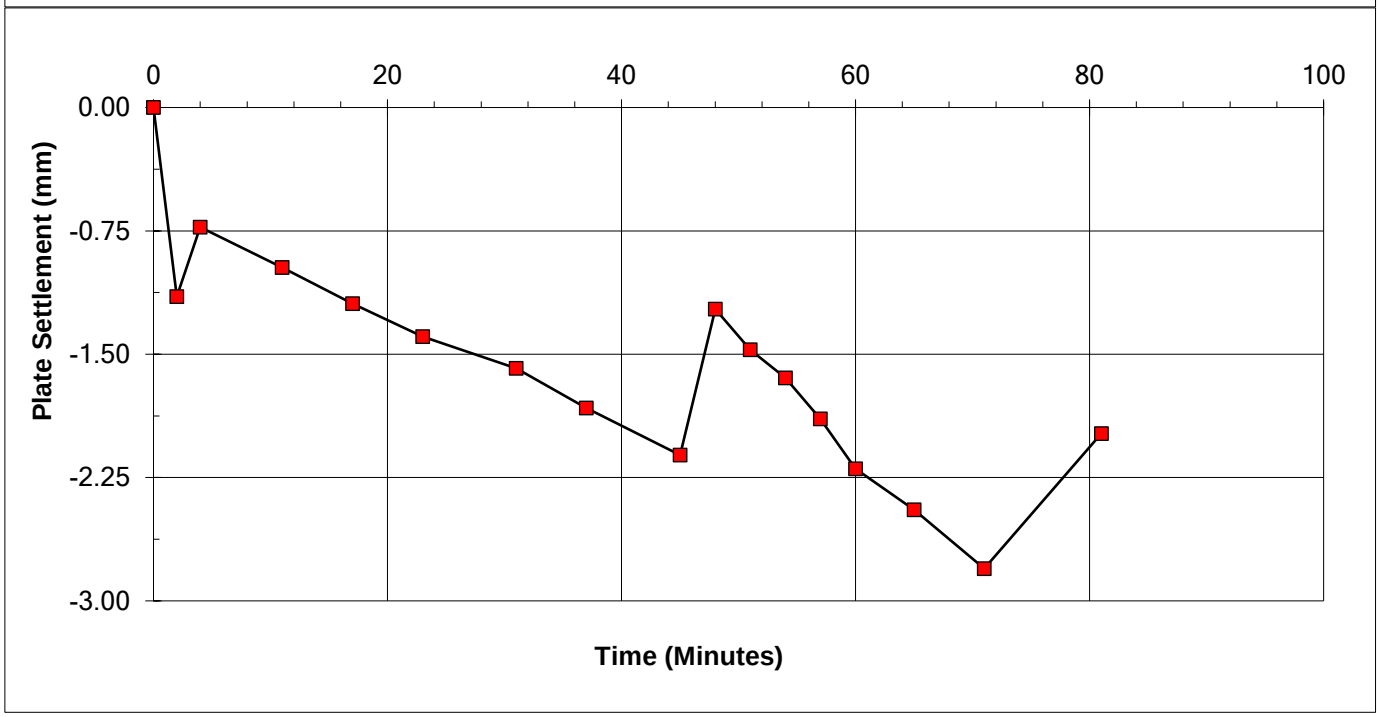
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 28-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/63		
TEST LOCATION	~~B18 L0~~ C18 L8	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	27-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4980	4757	4871	4869	0.00	0.00	0.0
4831	4709	4817	4786	-0.84	7.00	24.8
4946	4726	4834	4835	-0.34	0.00	0.0
4923	4702	4811	4812	-0.57	2.00	7.1
4908	4687	4786	4794	-0.76	6.00	21.2
4873	4669	4767	4770	-1.00	10.00	35.4
4857	4644	4743	4748	-1.21	12.00	42.4
4845	4631	4729	4735	-1.34	14.00	49.5
4820	4603	4681	4701	-1.68	17.00	60.1
4860	4643	4751	4751	-1.18	0.00	0.0
4842	4617	4725	4728	-1.41	4.00	14.1
4808	4594	4690	4697	-1.72	8.00	28.3
4790	4571	4641	4667	-2.02	11.00	38.9
4760	4556	4618	4645	-2.25	14.00	49.5
4729	4535	4594	4619	-2.50	19.00	67.2
4721	4496	4581	4599	-2.70	21.00	74.3
4763	4557	4723	4681	-1.88	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	49	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	62	kPa
Modulus of subgrade reaction (k) =	50	MPa/m
Equivalent 762 mm plate reaction =	40	MPa/m
Equivalent CBR =	5.8	%
Surface Stiffness Modulus (E) =	54	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 28-Sep-22

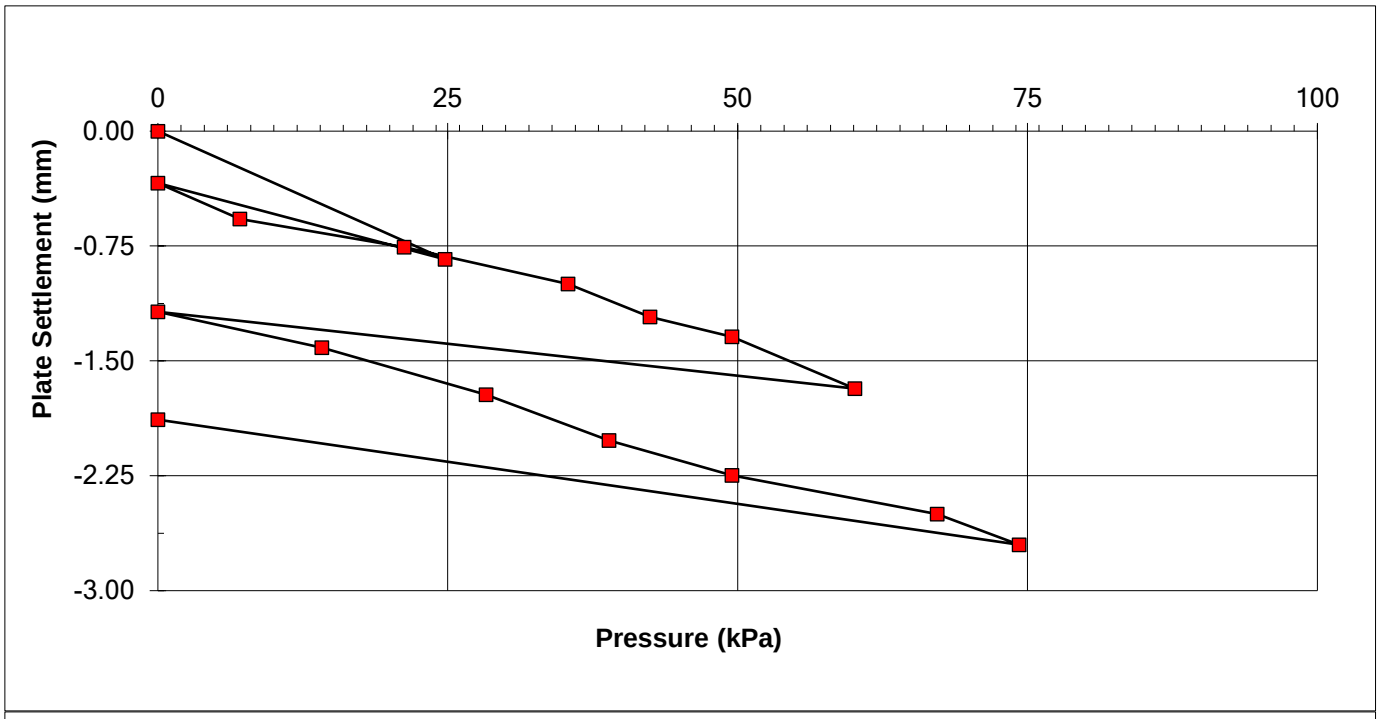
MURRAY RIX

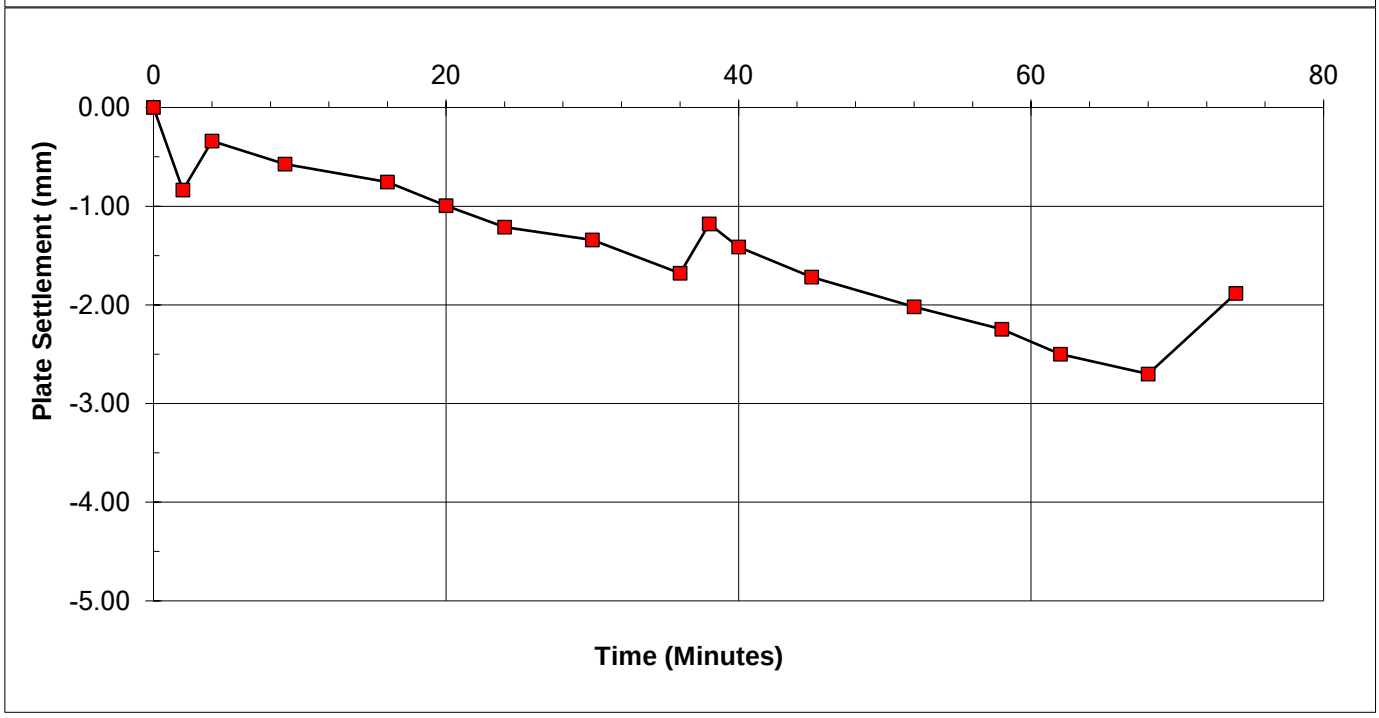
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 28-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/63

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	27/09/2022
DATE OF TEST	27/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	27/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117051	B17 L8	Black Ash/Sand	1.89	1.66	14	99.8	3.2
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 28-Sep-22

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/64
Date of Issue 28 September 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

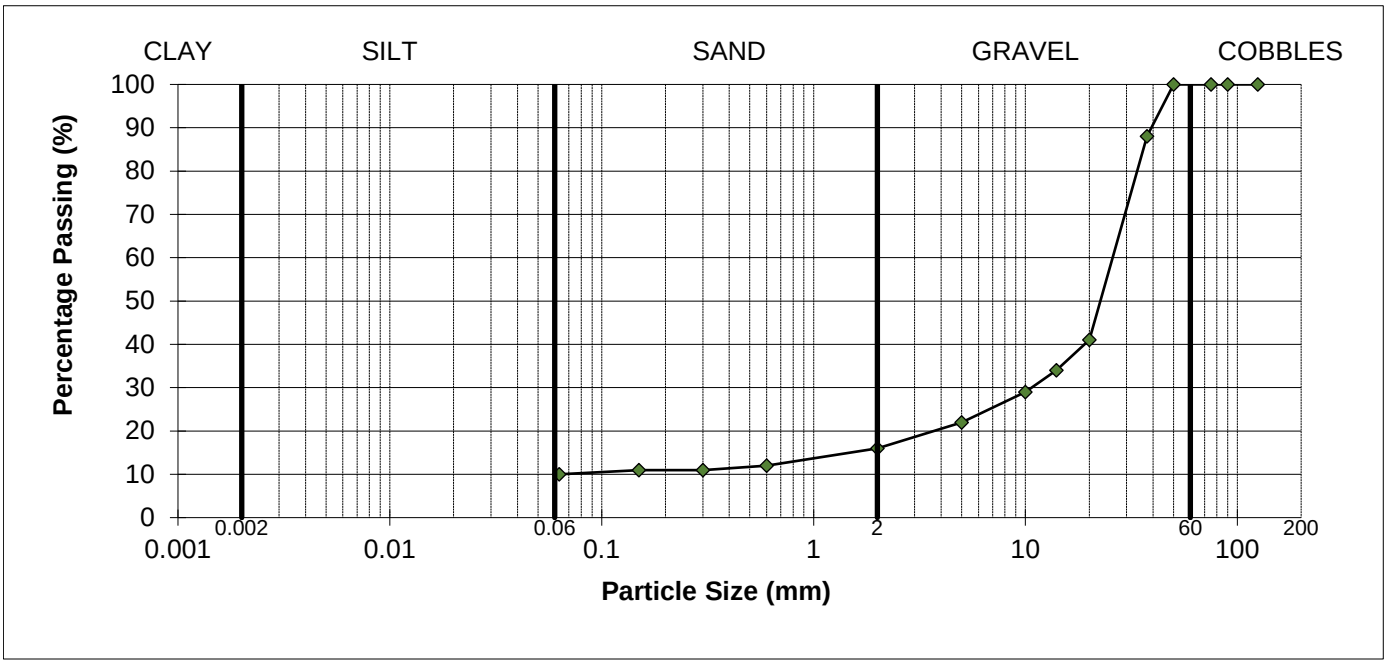
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/64

SAMPLE LABEL	TPD-Yellow Gravel-1	DATE SAMPLED	15-Aug-22
LAB SAMPLE No	115498	DATE RECEIVED	15-Aug-22
DATE TESTED	01-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	29	
90	100		5	22	
75	100		2	16	
50	100		0.6	12	
37.5	88		0.3	11	
20	41		0.15	11	
14	34		0.063	10	



REMARKS
As received moisture content = 4.3%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 28-Sep-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

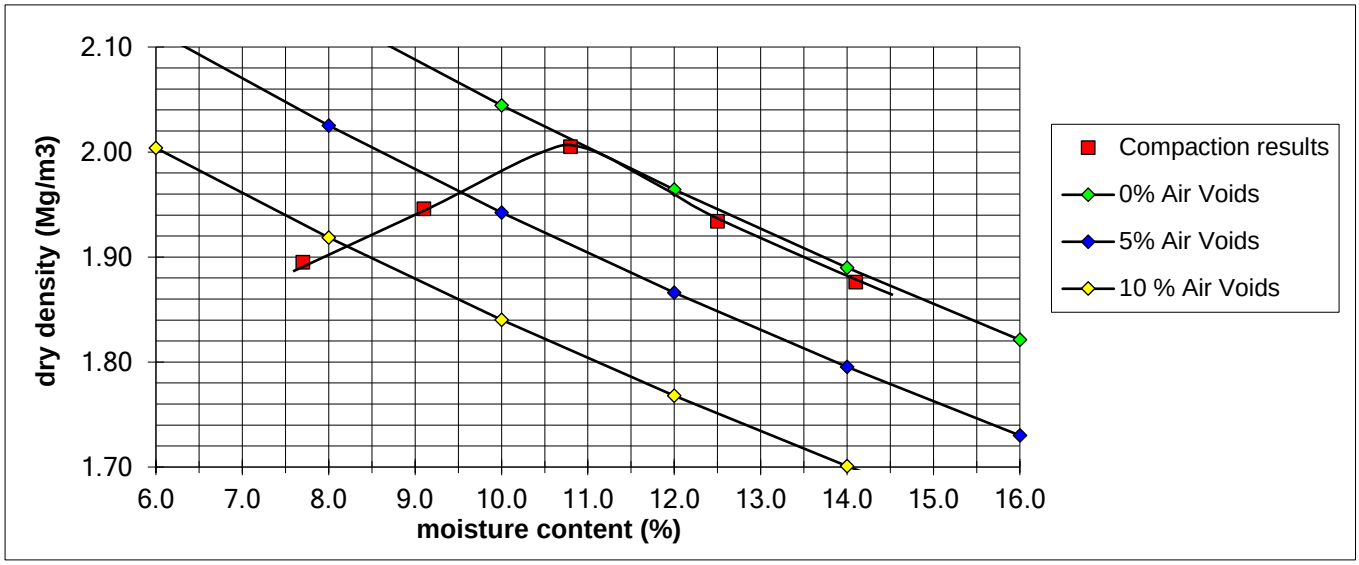
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/64

SAMPLE LABEL	TPD-Yellow Gravel-1	DATE SAMPLED	15-Aug-22
LAB SAMPLE No	115498	DATE RECEIVED	15-Aug-22
DATE TESTED	01-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	7.7	1.895
2	9.1	1.946
3	10.8	2.005
4	12.5	1.934
5	14.1	1.876
Optimum	11.0	
Maximum		2.00
Particle Density	2.57 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 12%
Percentage of material retained on 20mm sieve = 59%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 28-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

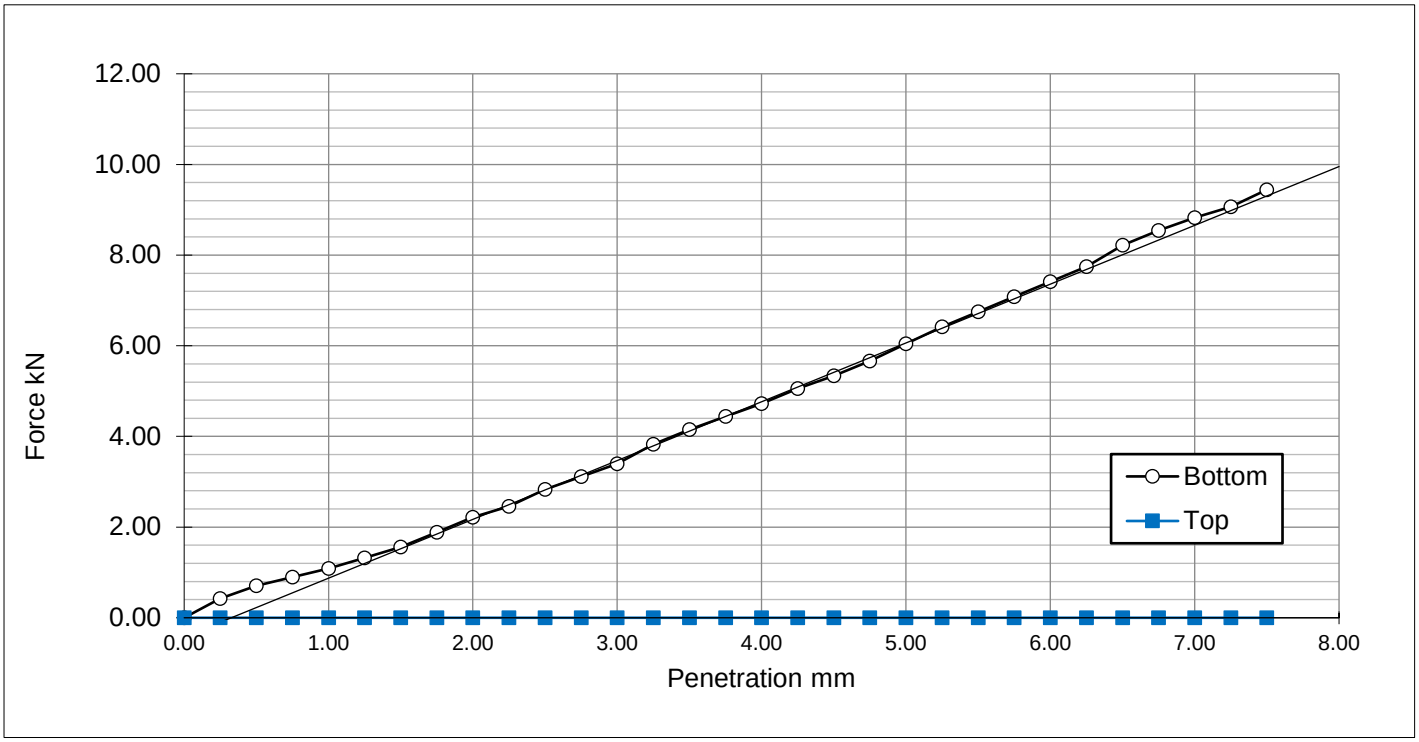
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/64

SAMPLE LABEL	TPD-Yellow Gravel-1	DATE SAMPLED	15-Aug-22
LAB SAMPLE No	115498	DATE RECEIVED	15-Aug-22
DATE TESTED	08-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		59 %			
BULK DENSITY	2.22 Mg/m3	MOISTURE CONTENT	11 %	DRY DENSITY	2.00 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	32	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	11	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 28-Sep-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

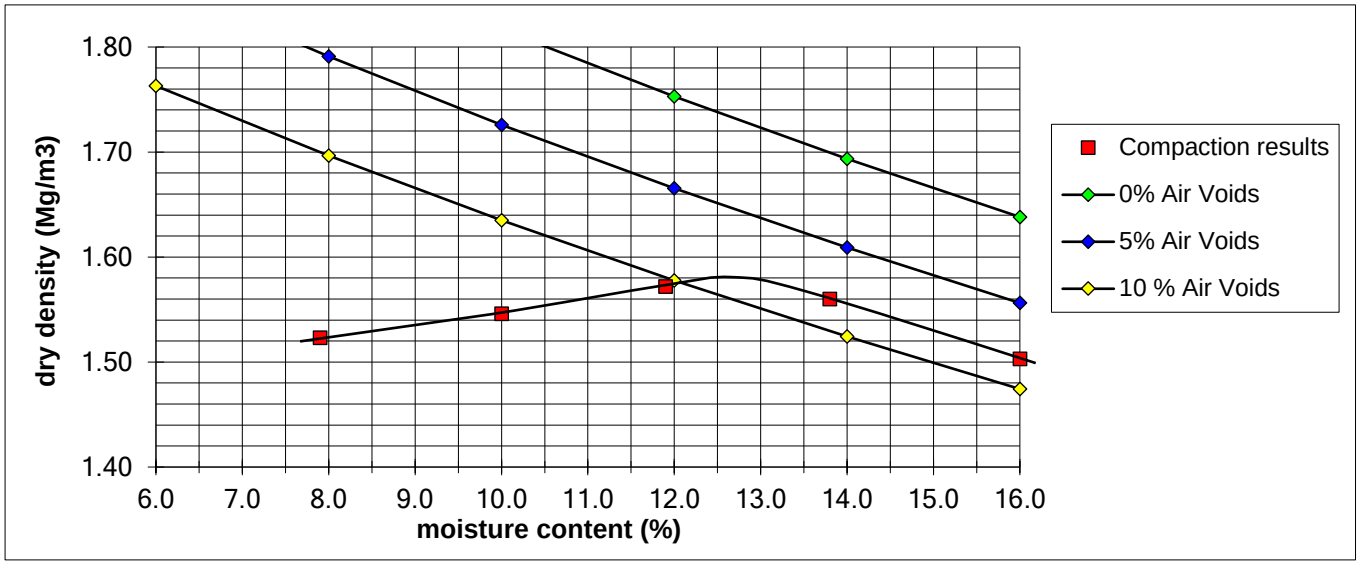
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/64

SAMPLE LABEL	See remarks	DATE SAMPLED	15-Aug-22
LAB SAMPLE No	115499	DATE RECEIVED	15-Aug-22
DATE TESTED	01-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		7.9	1.523
2		10.0	1.546
3		11.9	1.572
4		13.8	1.560
5		16.0	1.503
	Optimum	13.0	
	Maximum		1.58
	Particle Density	2.22 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 0%
Percentage of material retained on 20mm sieve = 10%
Sample label - C9/C10, L5+6, Grey sandy gravel 1+2

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 28-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/65
Date of Issue 30 September 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
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Also at: London: 020 8523 1999

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	28-Sep-22	**JOB NUMBER**	MRN 4454/65
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	A18 L1	225	1.80	1.60	13	96.2	8.7
2	A18 L2	225	1.78	1.58	13	95.0	9.6
3	B18 L2	225	1.88	1.61	17	97.1	1.5
4	B18 L1	225	1.91	1.65	16	99.2	0.2
5	B19 L2	225	1.83	1.58	16	94.9	5.1
6	B19 L1	225	1.84	1.64	12	99.0	7.5
7	A19 L2	225	1.90	1.65	15	99.1	1.4
8	A19 L1	225	1.92	1.67	15	100.4	0.3

Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
Particle Density (Mg/m3)	2.25	(Advised by client)
Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 30-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/65		
TEST LOCATION	D16 L8	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	29-Sep-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4764	4722	4670	4719	0.00	0.00	0.0
4711	4676	4635	4674	-0.45	6.00	21.2
4750	4702	4654	4702	-0.17	0.00	0.0
4737	4689	4639	4688	-0.30	4.00	14.1
4706	4660	4612	4659	-0.59	7.00	24.8
4693	4647	4595	4645	-0.74	8.00	28.3
4687	4631	4579	4632	-0.86	10.00	35.4
4671	4617	4567	4618	-1.00	13.00	46.0
4625	4557	4537	4573	-1.46	16.00	56.6
4662	4651	4624	4646	-0.73	0.00	0.0
4645	4637	4602	4628	-0.91	2.00	7.1
4625	4622	4588	4612	-1.07	5.00	17.7
4613	4602	4568	4594	-1.24	8.00	28.3
4591	4585	4548	4575	-1.44	11.00	38.9
4568	4576	4522	4555	-1.63	14.00	49.5
4504	4530	4507	4514	-2.05	17.00	60.1
4604	4625	4593	4607	-1.11	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	56	kPa
Modulus of subgrade reaction (k) =	45	MPa/m
Equivalent 762 mm plate reaction =	36	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	48	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.2	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 30-Sep-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,

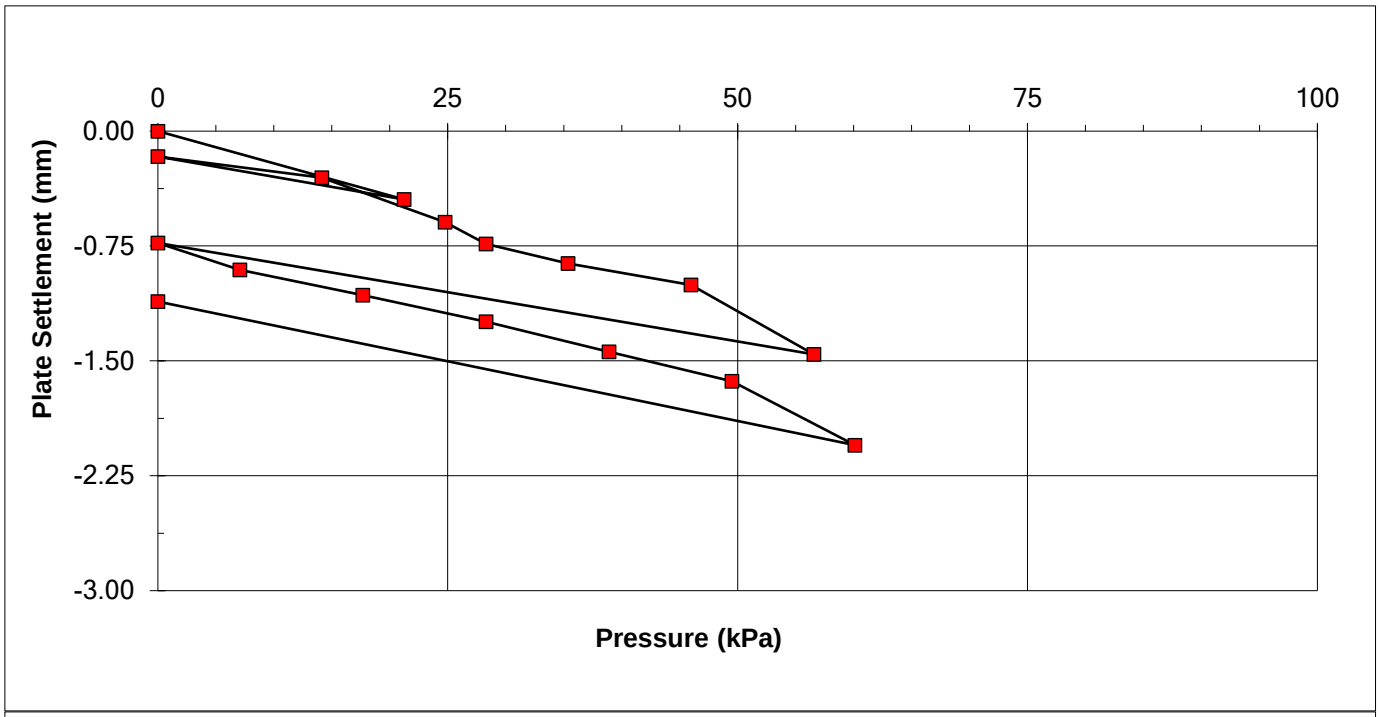
DUKINFIELD, CHESHIRE SK16 4QX

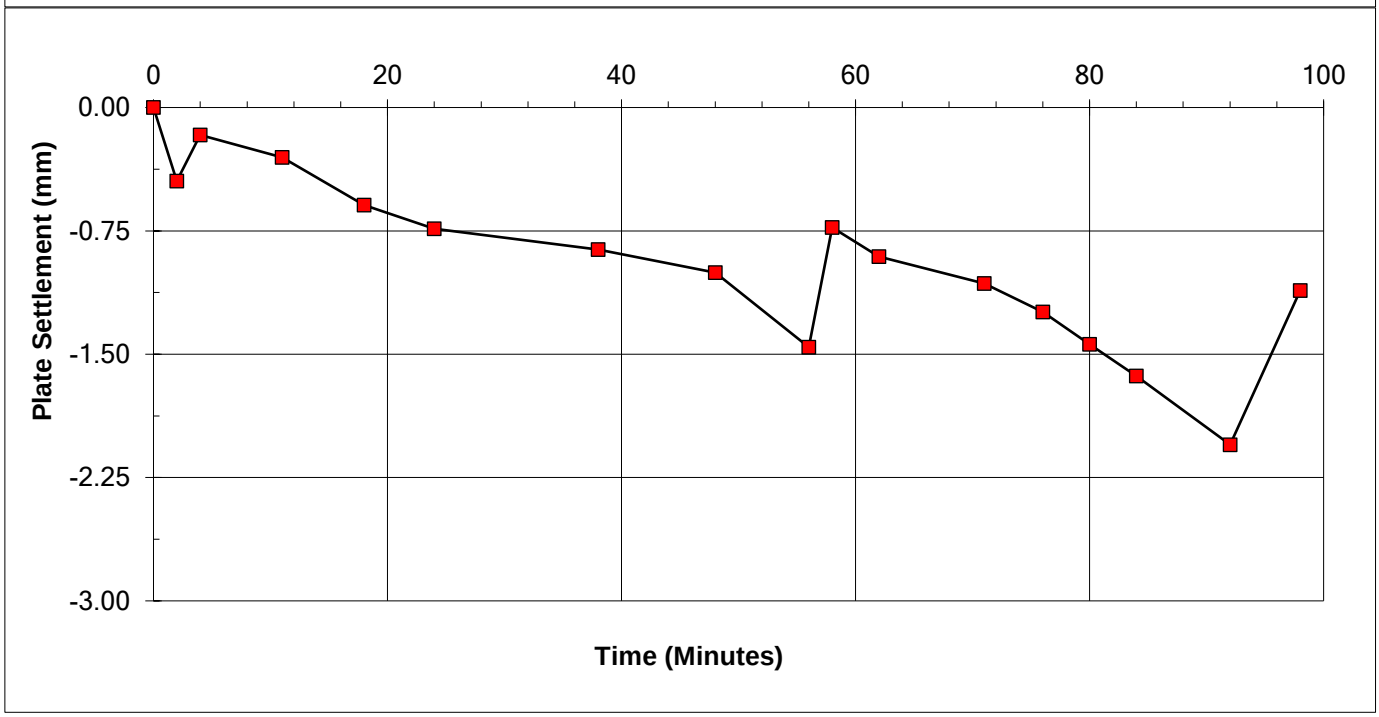
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS

Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 30-Sep-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/65

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	28/09/2022
DATE OF TEST	28/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	28/09/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117133	A18 L2	Black Ash/Sand	1.85	1.67	11	100.4	7.6
117134	A18 L1	Brown Ash/Sand	1.84	1.63	13	98.1	6.5
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 30-Sep-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/66
Date of Issue 04 October 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	30-Sep-22	**JOB NUMBER**	MRN 4454/66
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	F20 L1	225	1.89	1.60	18	96.4	-0.1
2	E20 L1	225	1.90	1.63	17	98.0	0.3
3	E19 L1	225	1.88	1.62	16	97.7	2.1
4	E18 L1	225	1.90	1.68	13	101.3	3.5
5	E17 L1	225	1.81	1.57	15	94.7	6.7
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.66	(Advised by client)	
				Particle Density (Mg/m3)	2.25	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 04-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	30-Sep-22	**JOB NUMBER**	MRN 4454/66
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B14 L1	225	1.89	1.60	18	104.4	6.4
2	B13 L1	225	1.85	1.54	20	100.4	6.6
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.53	(Advised by client)
					Particle Density (Mg/m3)	2.47	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 04-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/66

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	30/09/2022
DATE OF TEST	30/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	01/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117137	SRD E19 L1	Black Ash/Sand	1.90	1.64	16	98.6	1.1
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 04-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/66

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	30/09/2022
DATE OF TEST	30/09/2022	SAMPLED BY	Murray Rix
DATE TESTED	01/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117138	SRD B13 L1	Black Ash/Sand	1.81	1.56	16	102.0	3.2
		Maximum Dry Density (Mg/m^3)		1.53		(Advised by client)	
		Particle Density (Mg/m^3)		2.17		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 04-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/67
Date of Issue 06 October 2022
Page 1 of 16

Approved Signatories

S J Hutchings, O P Davies

Notes

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

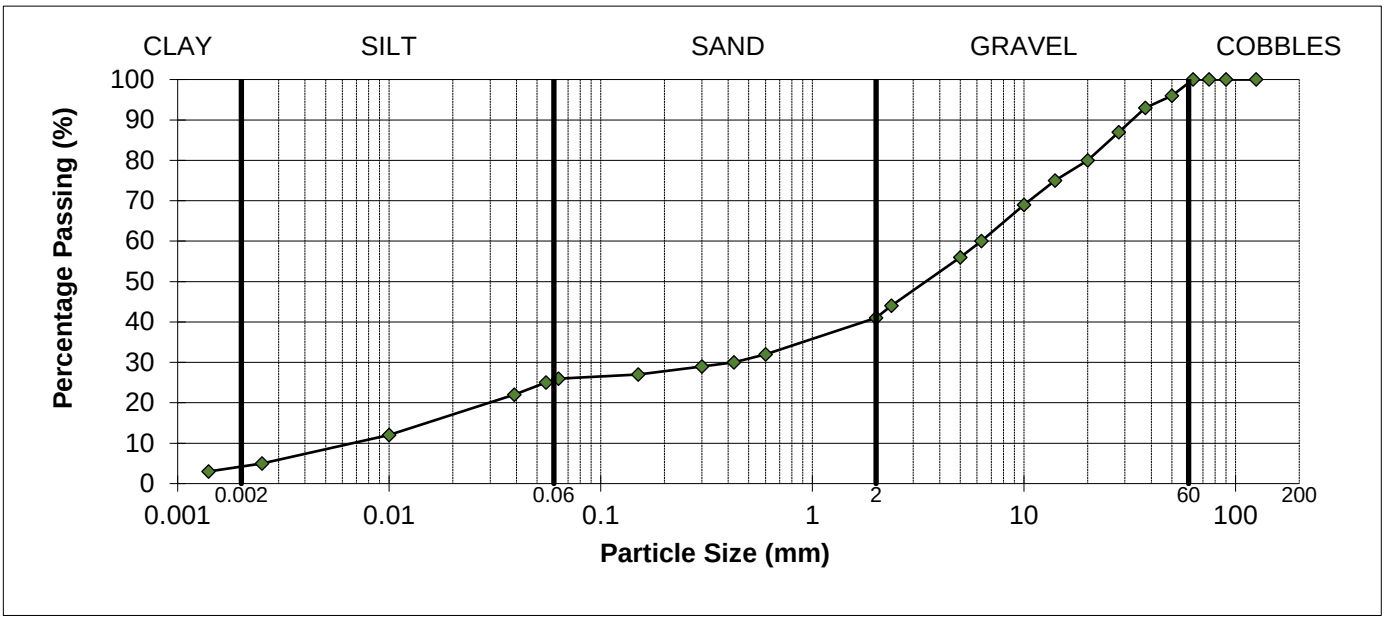
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, B16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	44	
90	100		2	41	
75	100		0.6	32	
63	100		0.425	30	
50	96		0.3	29	
37.5	93		0.15	27	
28	87		0.063	26	
20	80		0.055	25	
14	75		0.039	22	
10	69		0.01	12	
6.3	60		0.0025	5	
5	56		0.0014	3	



REMARKS
As received moisture content = 14%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

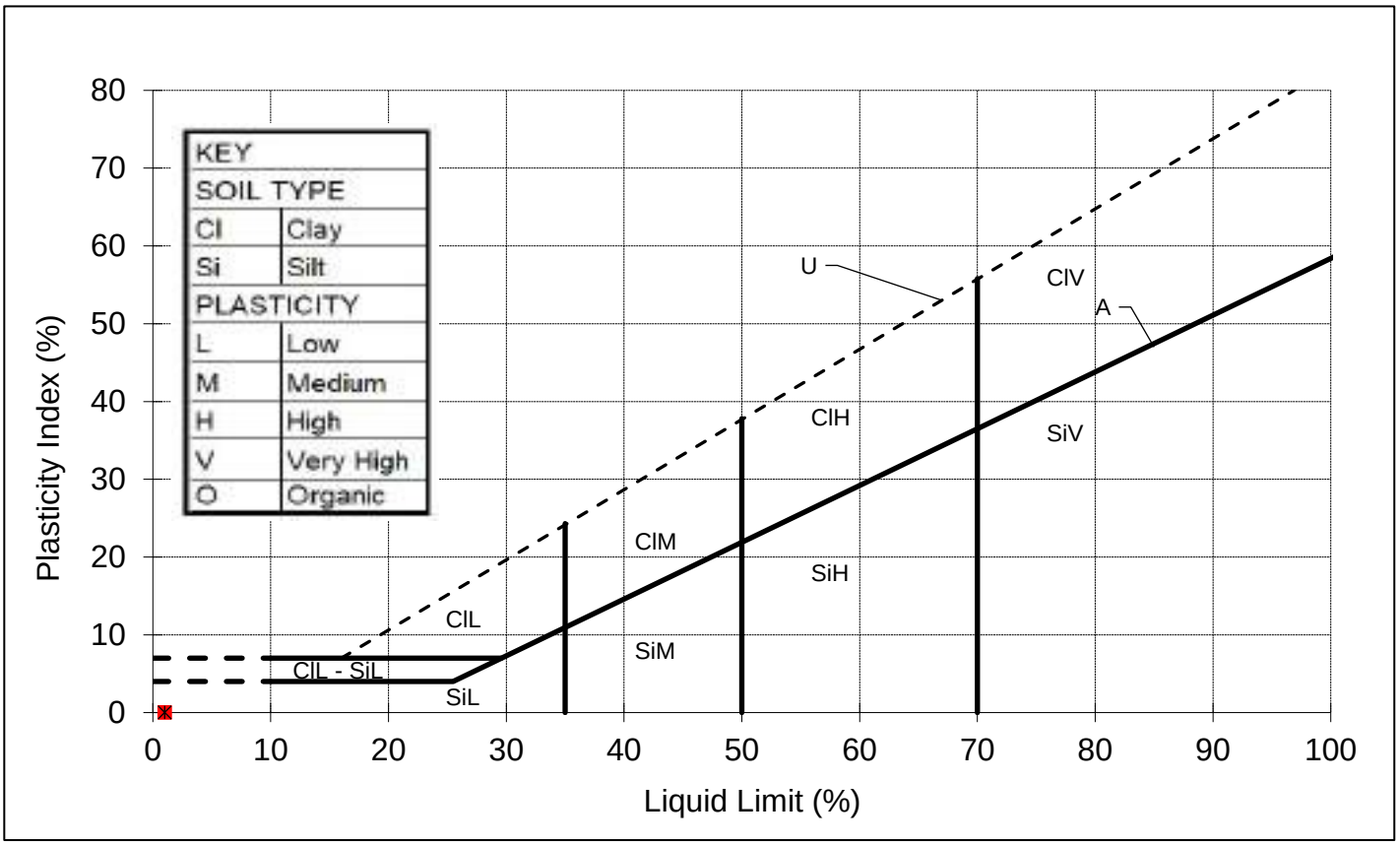
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, B16	DATE SAMPLED	02-Sep-22
SAMPLE No.	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14	N/A	Non Plastic	N/A	30



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 06-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

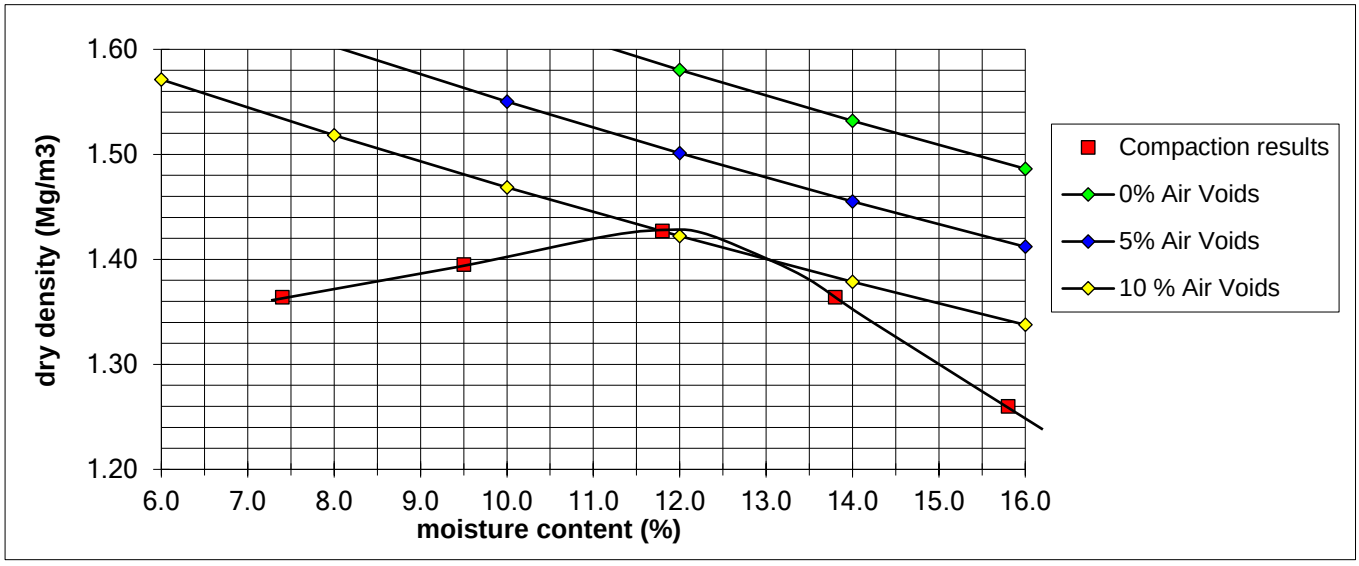
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, B16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	7.4	1.364
2	9.5	1.395
3	11.8	1.427
4	13.8	1.364
5	15.8	1.260
Optimum	12.0	
Maximum		1.42
Particle Density	1.95 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 7%
Percentage of material retained on 20mm sieve = 20%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

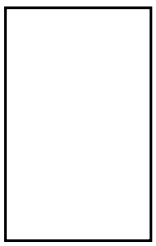
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3 B16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	201	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	16	%
BULK DENSITY	1.43	Mg/m3
DRY DENSITY	1.26	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	11	1.02	790	395

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO
BS 1377: PART 4: Clause 7: 1990
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2 (oven dry)

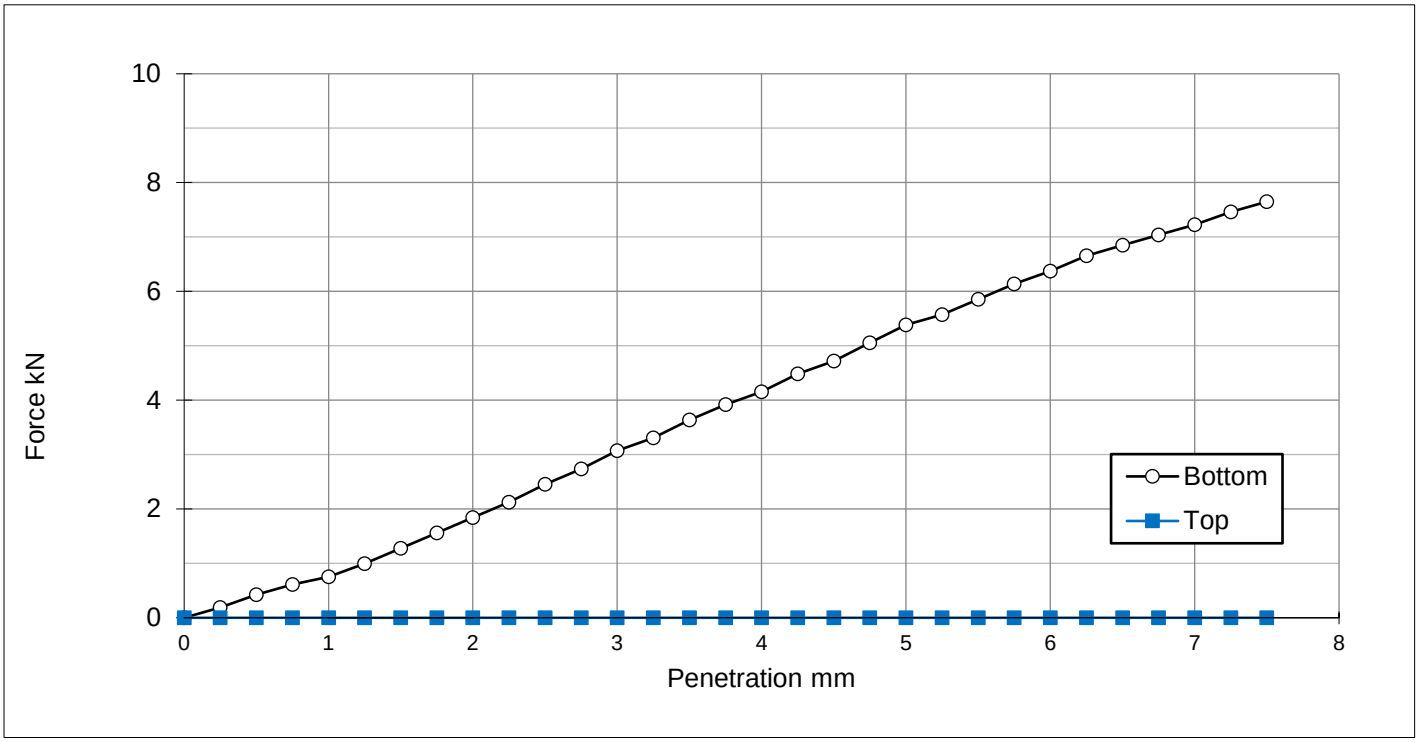
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, B16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	01-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		20 %			
BULK DENSITY	1.43 Mg/m3	MOISTURE CONTENT	16 %	DRY DENSITY	1.23 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE			ORIGIN CORRECTION			FINAL MOISTURE CONTENT		
Top	N/A	%	Top	N/A	mm	Top	N/A	%
Bottom	27	%	Bottom	N/A	mm	Bottom	16	%

REMARKS
Sample re-compacted to OMC/MDD.

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 06-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

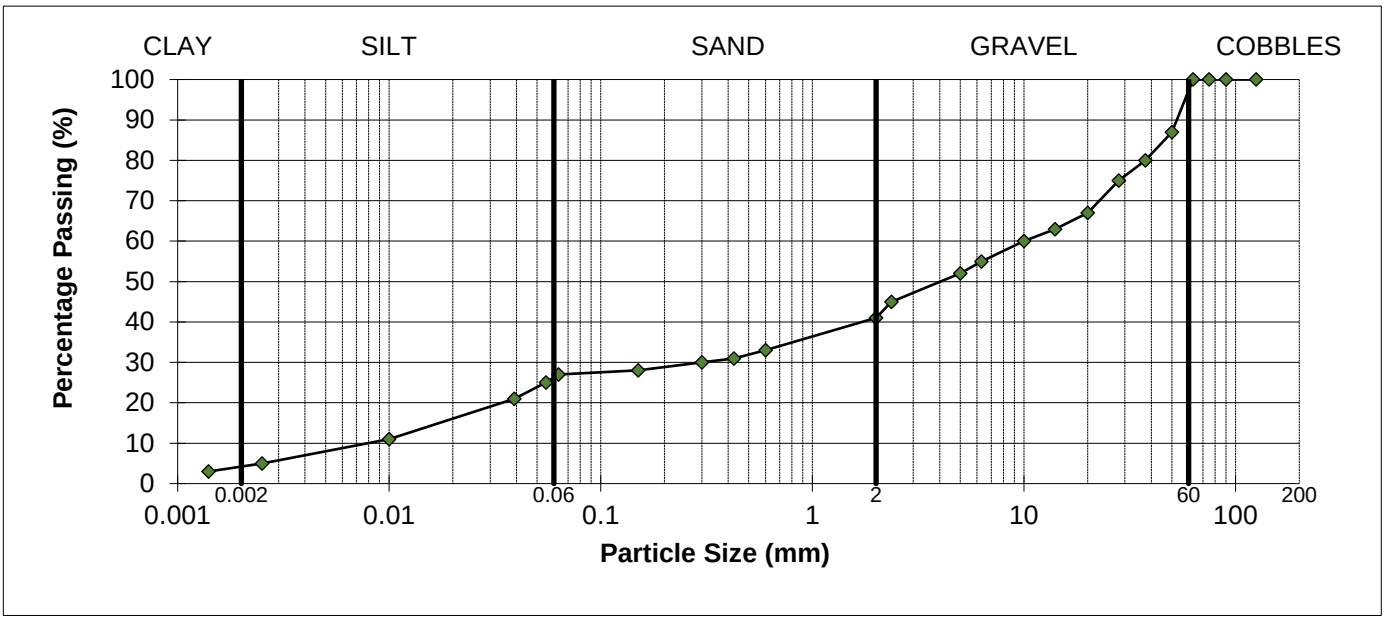
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, C16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116296	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	45	
90	100		2	41	
75	100		0.6	33	
63	100		0.425	31	
50	87		0.3	30	
37.5	80		0.15	28	
28	75		0.063	27	
20	67		0.055	25	
14	63		0.039	21	
10	60		0.01	11	
6.3	55		0.0025	5	
5	52		0.0014	3	



REMARKS
As received moisture content = 11%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

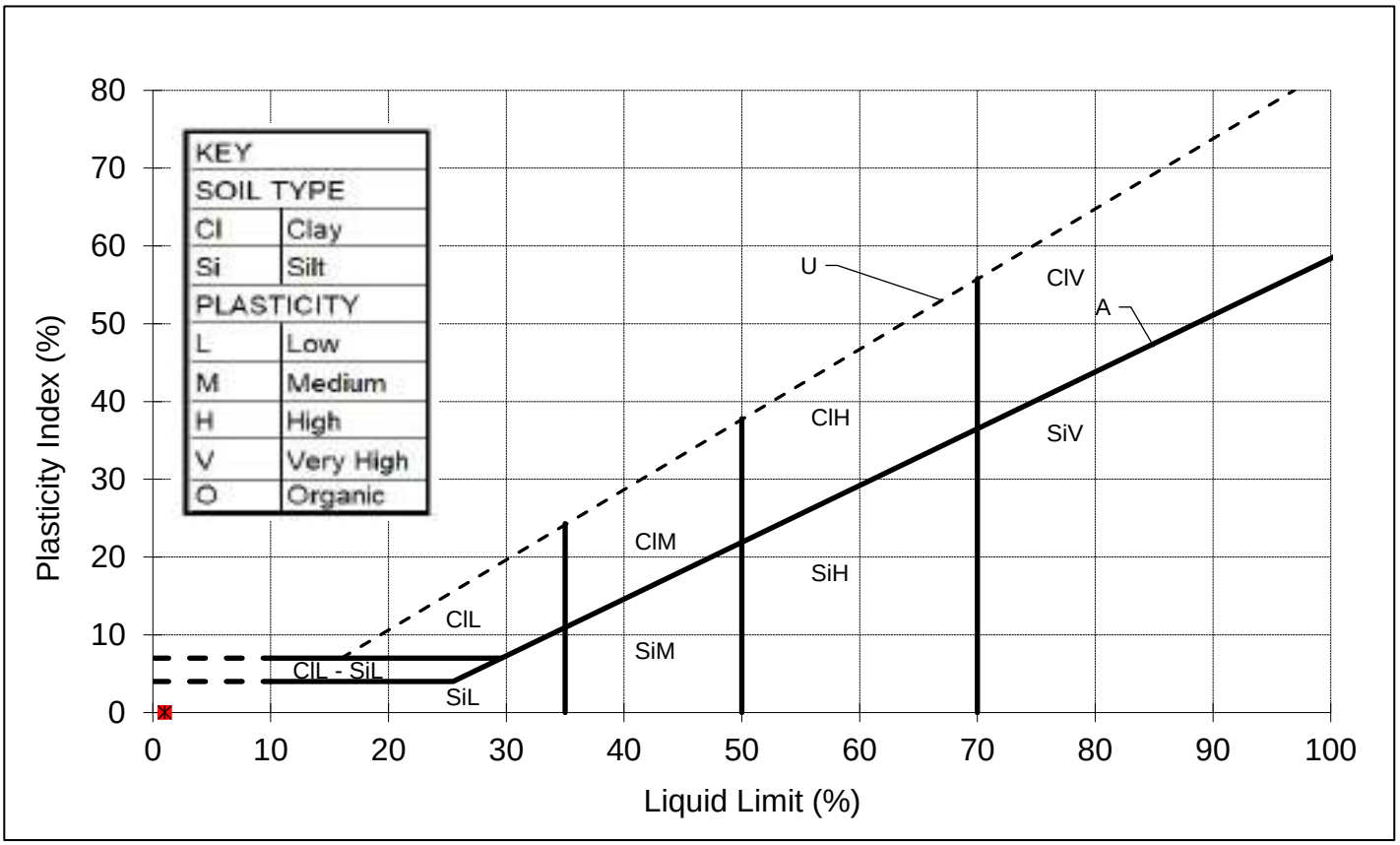
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, C16	DATE SAMPLED	02-Sep-22
SAMPLE No.	116296	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
11	N/A	Non Plastic	N/A	31



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 06-Oct-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

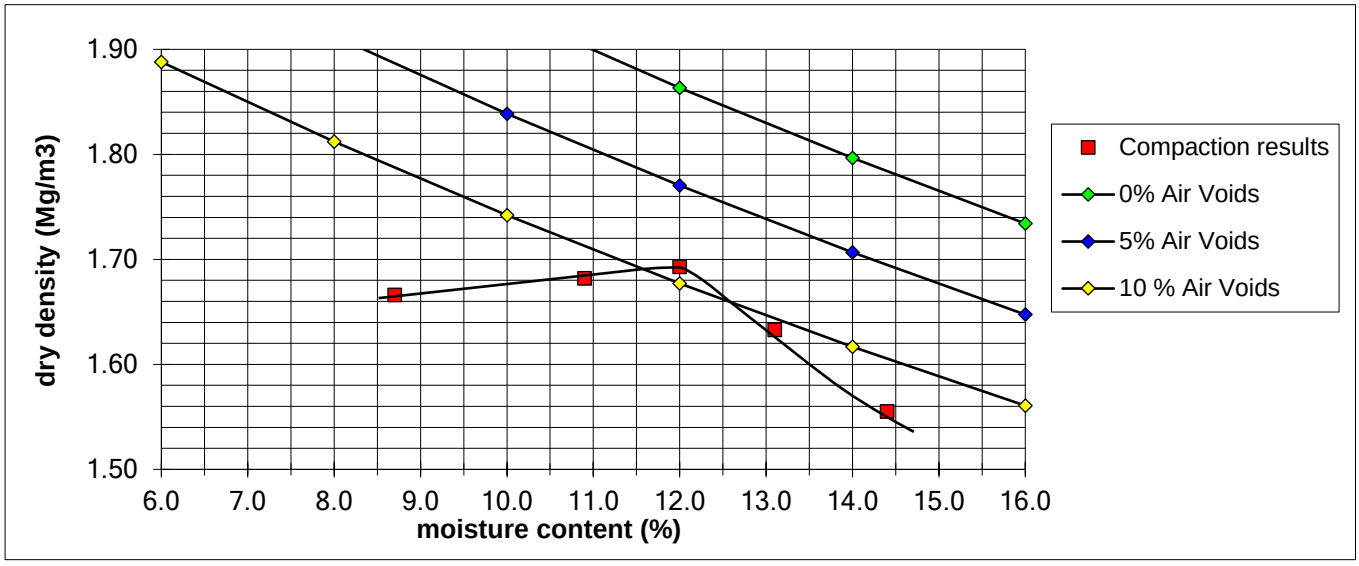
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, C16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	8.7	1.666
2	10.9	1.682
3	12.0	1.693
4	13.1	1.633
5	14.4	1.555
Optimum	12.0	
Maximum		1.69
Particle Density	2.40 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 20%
Percentage of material retained on 20mm sieve = 33%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

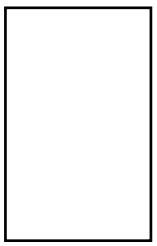
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3 C16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116296	DATE RECEIVED	02-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	201	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	14	%
BULK DENSITY	1.80	Mg/m3
DRY DENSITY	1.58	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	18	1.39	577	289

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO
BS 1377: PART 4: Clause 7: 1990
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2 (oven dry)

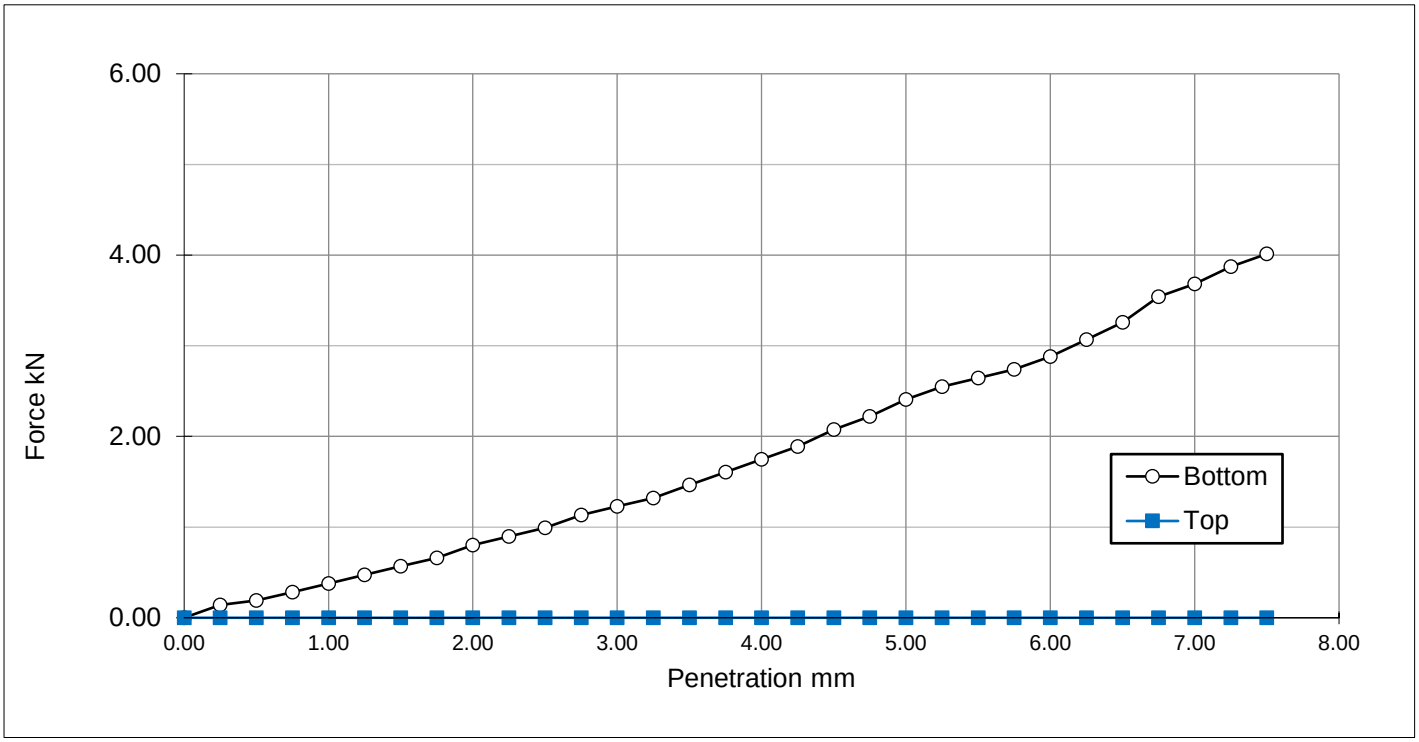
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, C16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116296	DATE RECEIVED	02-Sep-22
DATE TESTED	01-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		33 %			
BULK DENSITY	1.80 Mg/m3	MOISTURE CONTENT	14 %	DRY DENSITY	1.58 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	12	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	14	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 06-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

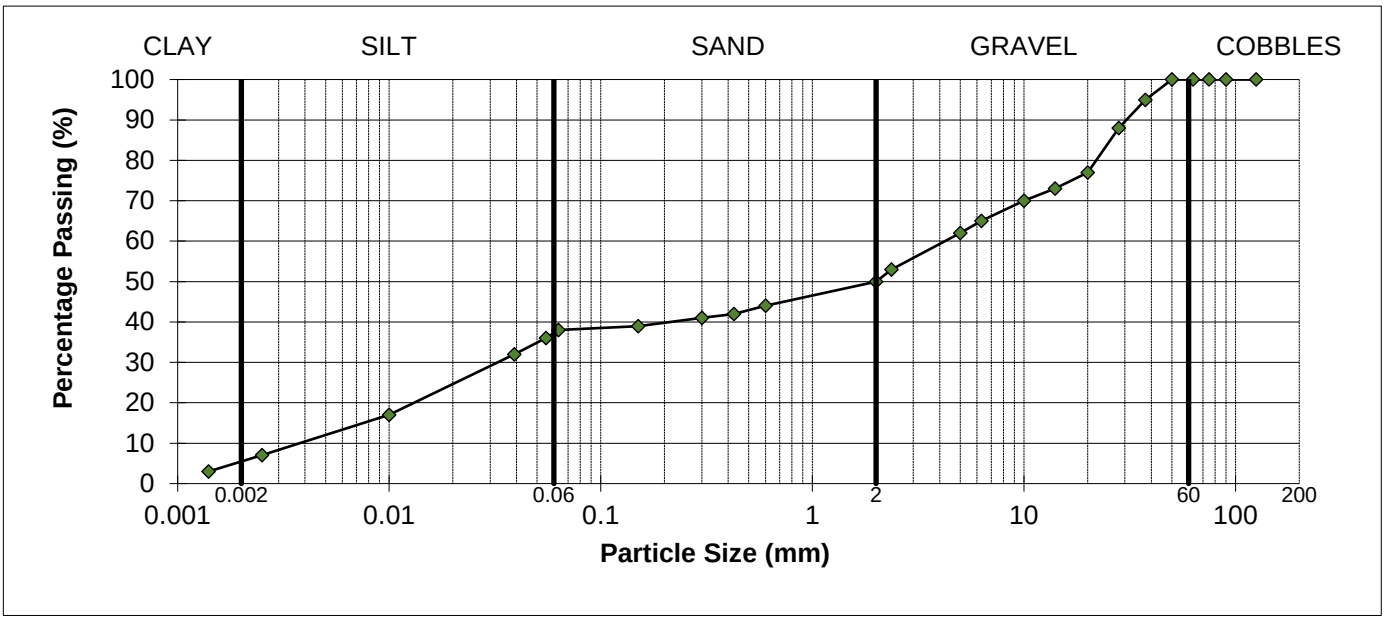
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, D16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116297	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	53	
90	100		2	50	
75	100		0.6	44	
63	100		0.425	42	
50	100		0.3	41	
37.5	95		0.15	39	
28	88		0.063	38	
20	77		0.055	36	
14	73		0.039	32	
10	70		0.01	17	
6.3	65		0.0025	7	
5	62		0.0014	3	



REMARKS
As received moisture content = 14%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

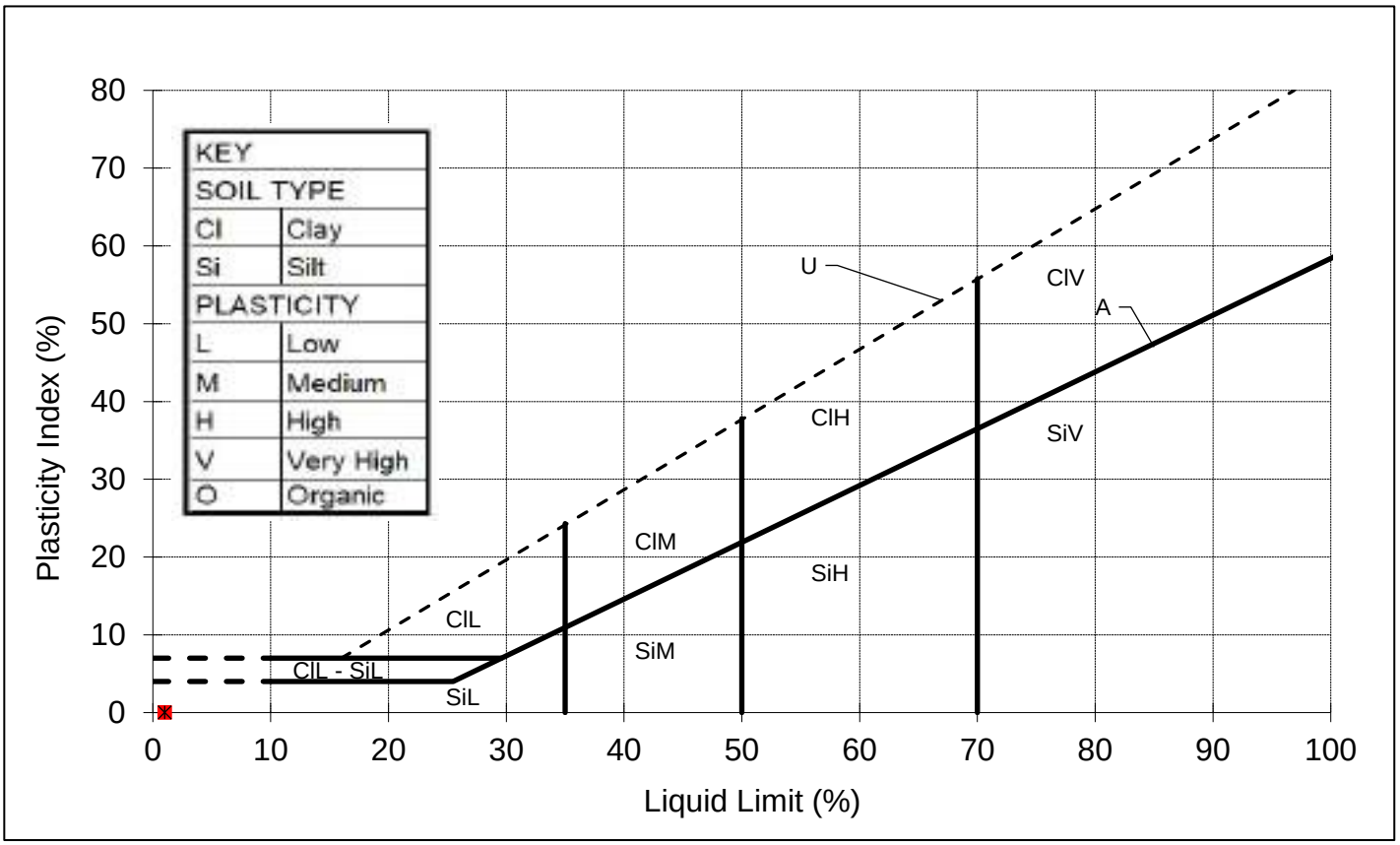
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, D16	DATE SAMPLED	02-Sep-22
SAMPLE No.	116297	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14	N/A	Non Plastic	N/A	42



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 06-Oct-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

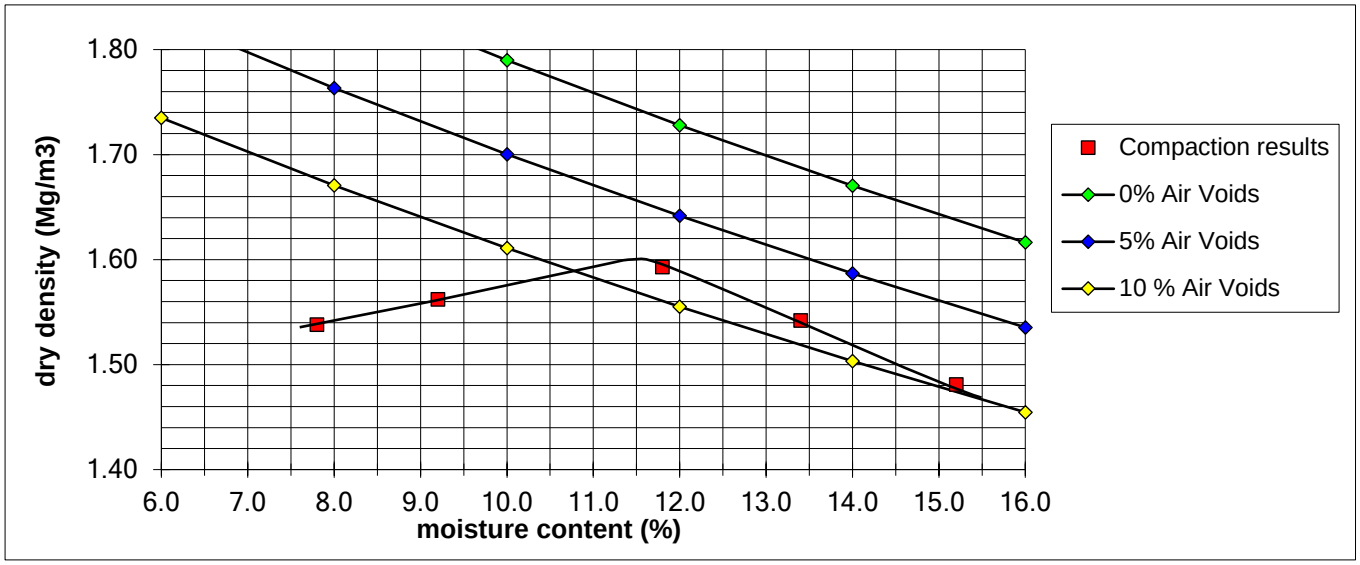
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, D16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116295	DATE RECEIVED	02-Sep-22
DATE TESTED	12-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		7.8	1.538
2		9.2	1.562
3		11.8	1.593
4		13.4	1.542
5		15.2	1.481
	Optimum	12.0	
	Maximum		1.60
	Particle Density	2.18 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 5%
Percentage of material retained on 20mm sieve = 23%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

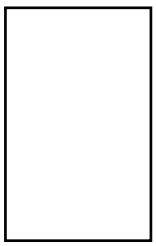
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3 D16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116297	DATE RECEIVED	02-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	201	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	14	%
BULK DENSITY	1.69	Mg/m3
DRY DENSITY	1.48	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	14	1.17	559	280

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 06-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO
BS 1377: PART 4: Clause 7: 1990
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2 (oven dry)

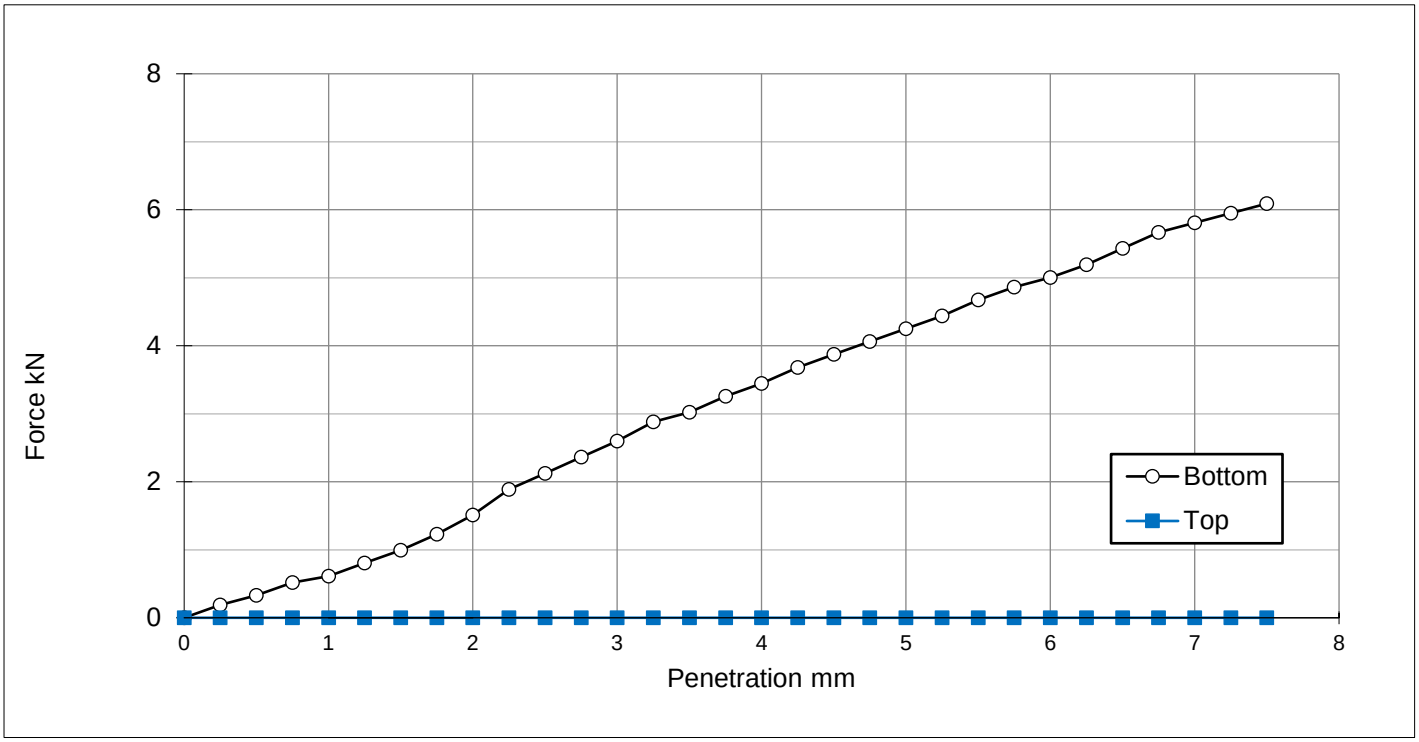
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/67

SAMPLE LABEL	L3, D16	DATE SAMPLED	02-Sep-22
LAB SAMPLE No	116297	DATE RECEIVED	02-Sep-22
DATE TESTED	01-Oct-22	SAMPLED BY	Client

MATERIAL	Black Ash, brick, clay MIX
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		23 %			
BULK DENSITY	1.69 Mg/m3	MOISTURE CONTENT	14 %	DRY DENSITY	1.48 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	21	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	14	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 06-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number ~~MRN 4454/64~~ MRN 4454/68
Date of Issue 06 October 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

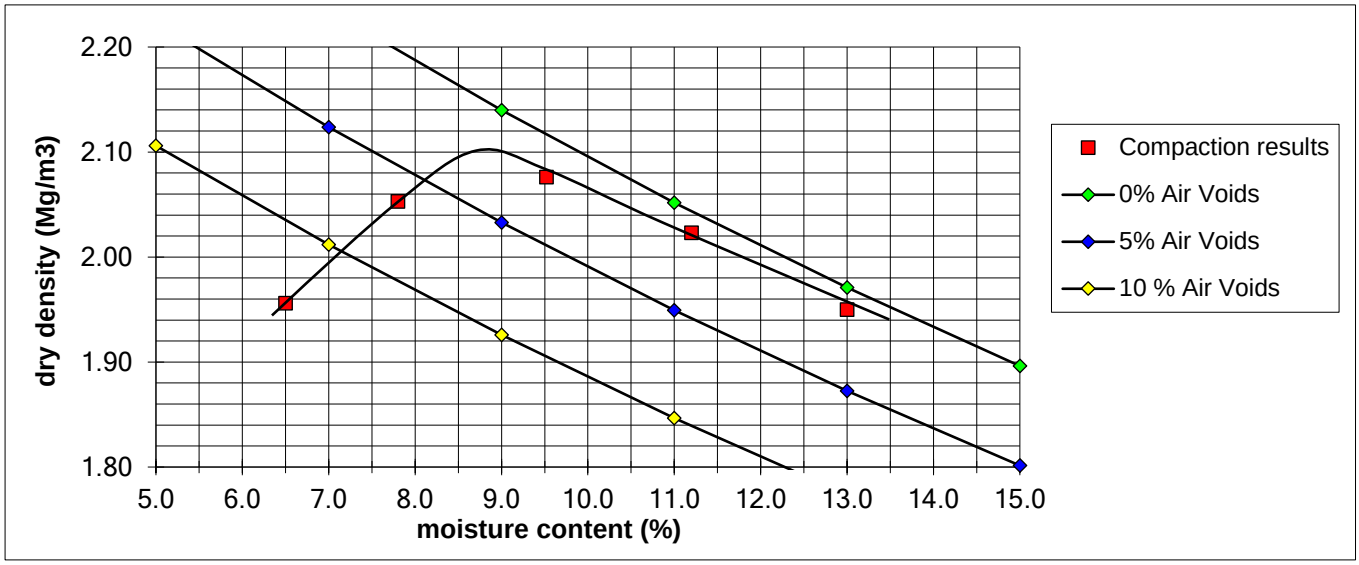
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/68

SAMPLE LABEL	SP-Yellow Gravel-4	DATE SAMPLED	09-Sep-22
LAB SAMPLE No	116542	DATE RECEIVED	09-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Gravel
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	6.5	1.956
2	7.8	2.053
3	9.5	2.076
4	11.2	2.023
5	13.0	1.950
Optimum	8.8	
Maximum		2.10
Particle Density	2.65 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 3%
Percentage of material retained on 20mm sieve = 46%
As received moisture content = 8.2%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

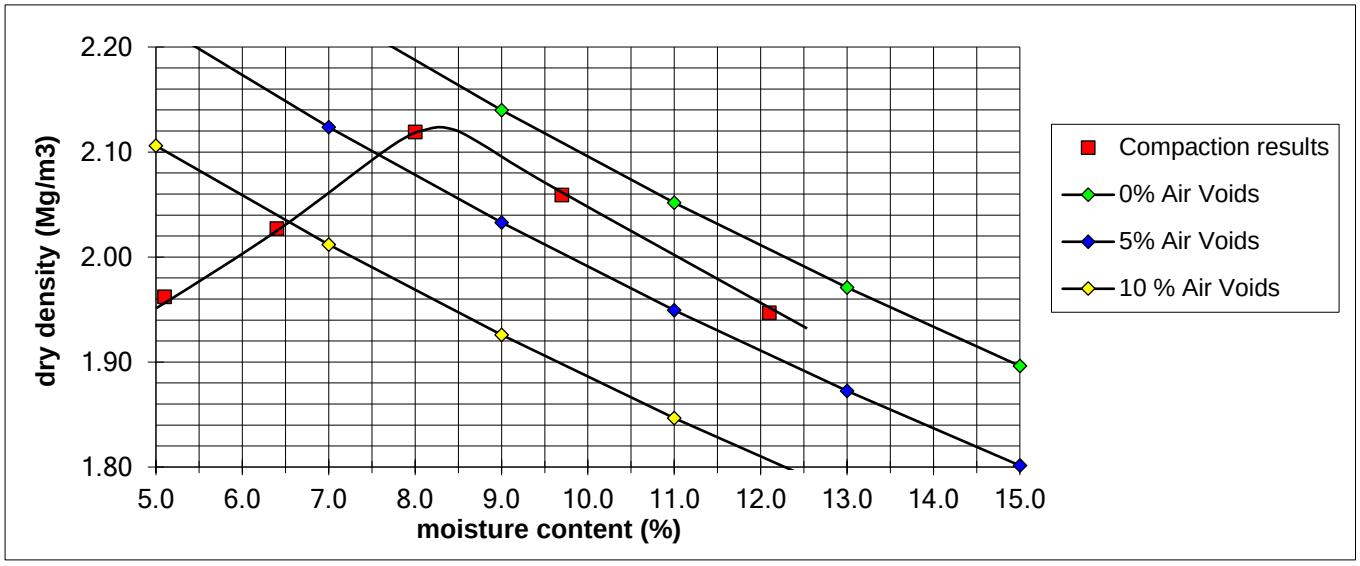
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/68

SAMPLE LABEL	SP-Yellow Gravel-5	DATE SAMPLED	09-Sep-22
LAB SAMPLE No	116543	DATE RECEIVED	09-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Gravel
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		5.1	1.962
2		6.4	2.027
3		8.0	2.119
4		9.7	2.059
5		12.1	1.947
	Optimum	8.2	
	Maximum		2.12
	Particle Density	2.65 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 6%
Percentage of material retained on 20mm sieve = 50%
As received moisture content = 7.5%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

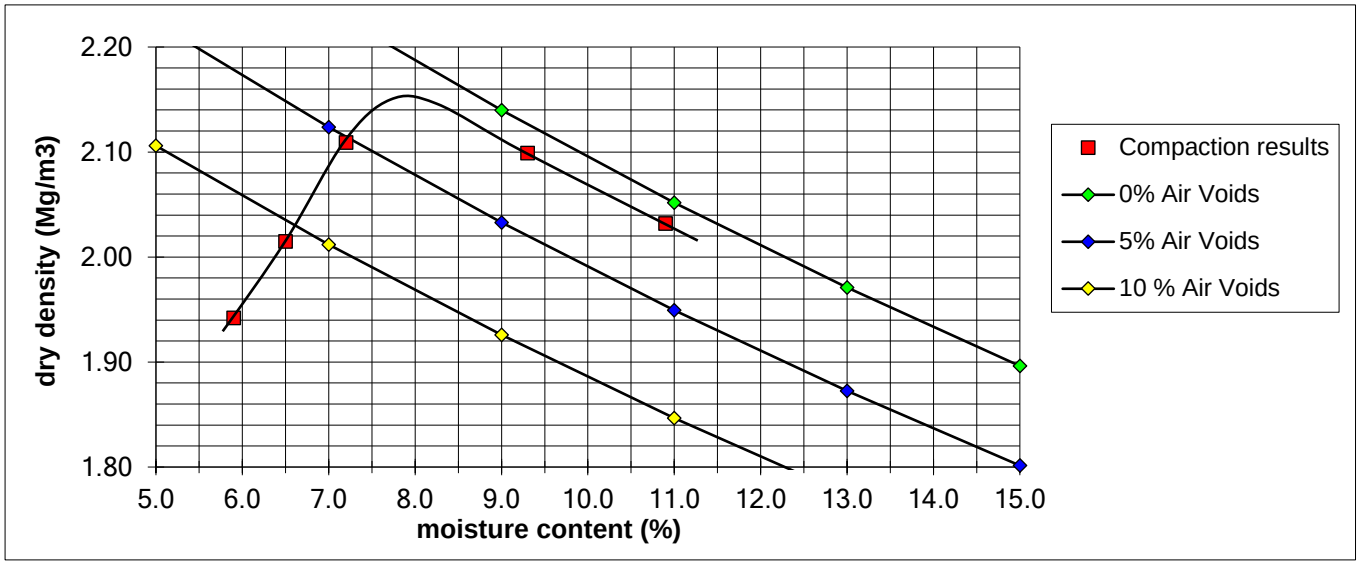
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/68

SAMPLE LABEL	SP-Yellow Gravel-6	DATE SAMPLED	09-Sep-22
LAB SAMPLE No	116544	DATE RECEIVED	09-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Gravel
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		5.9	1.942
2		6.5	2.015
3		7.2	2.109
4		9.3	2.099
5		10.9	2.032
	Optimum	7.8	
	Maximum		2.15
	Particle Density	2.65 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 5%
Percentage of material retained on 20mm sieve = 43%
As received moisture content = 7.8%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/69
Date of Issue 06 October 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

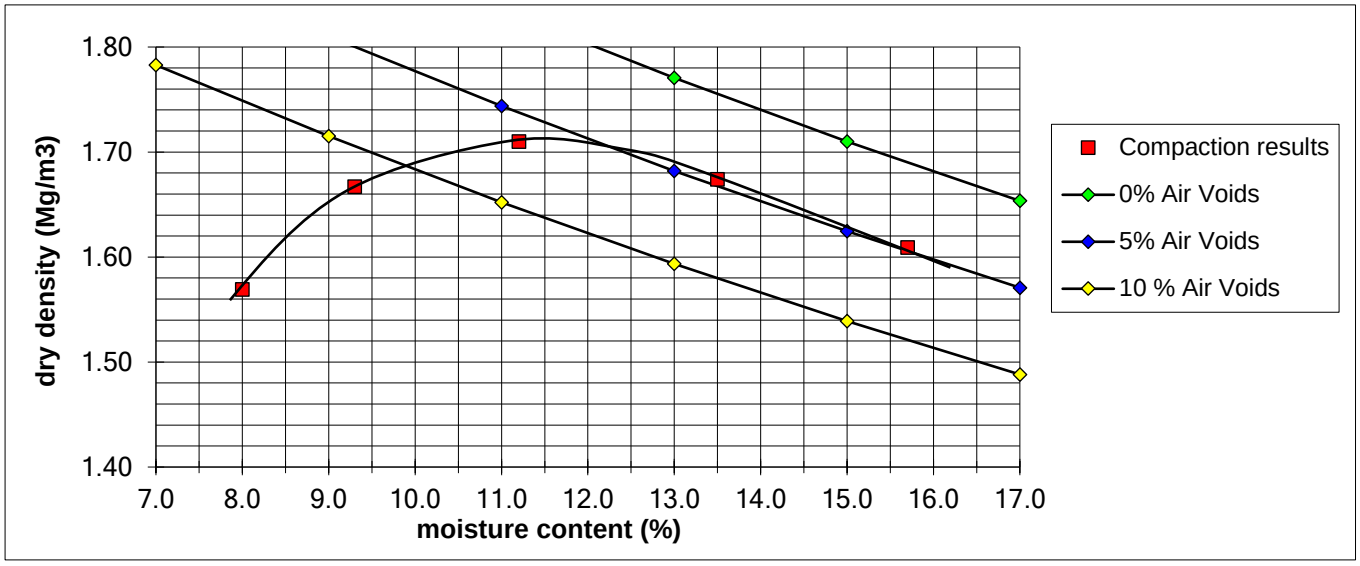
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/69

SAMPLE LABEL	Area 3, C17 (Layer 5)	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116621	DATE RECEIVED	13-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Gravel
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		8.0	1.569
2		9.3	1.667
3		11.2	1.710
4		13.5	1.674
5		15.7	1.609
	Optimum	12.0	
	Maximum		1.71
	Particle Density	2.3 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 5%
Percentage of material retained on 20mm sieve = 13%
As received moisture content = 18%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 06-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/70
Date of Issue 07 October 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/70		
TEST LOCATION	Test 01	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	06-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Yellow Gravel	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4553	4560	4558	4557	0.00	0.00	0.0
4394	4427	4425	4415	-1.42	18.00	63.7
4428	4441	4435	4435	-1.22	0.00	0.0
4397	4413	4403	4404	-1.53	11.00	38.9
4372	4388	4374	4378	-1.79	19.00	67.2
4342	4359	4340	4347	-2.10	35.00	123.8
4316	4332	4300	4316	-2.41	46.00	162.7
4283	4304	4270	4286	-2.71	60.00	212.2
4253	4277	4236	4255	-3.02	68.00	240.5
4368	4366	4338	4357	-2.00	0.00	0.0
4340	4336	4312	4329	-2.28	20.00	70.7
4306	4306	4283	4298	-2.59	31.00	109.6
4277	4274	4257	4269	-2.88	46.00	162.7
4246	4247	4231	4241	-3.16	59.00	208.7
4215	4210	4204	4210	-3.47	73.00	258.2
4190	4180	4171	4180	-3.77	88.00	311.2
4309	4293	4290	4297	-2.60	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	173	kPa
Modulus of subgrade reaction (k) =	138	MPa/m
Equivalent 762 mm plate reaction =	111	MPa/m
Equivalent CBR =	34.0	%
Surface Stiffness Modulus (E) =	168	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	223	kPa
Modulus of subgrade reaction (k) =	178	MPa/m
Equivalent 762 mm plate reaction =	143	MPa/m
Equivalent CBR =	52.6	%
Surface Stiffness Modulus (E) =	222	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 07-Oct-22

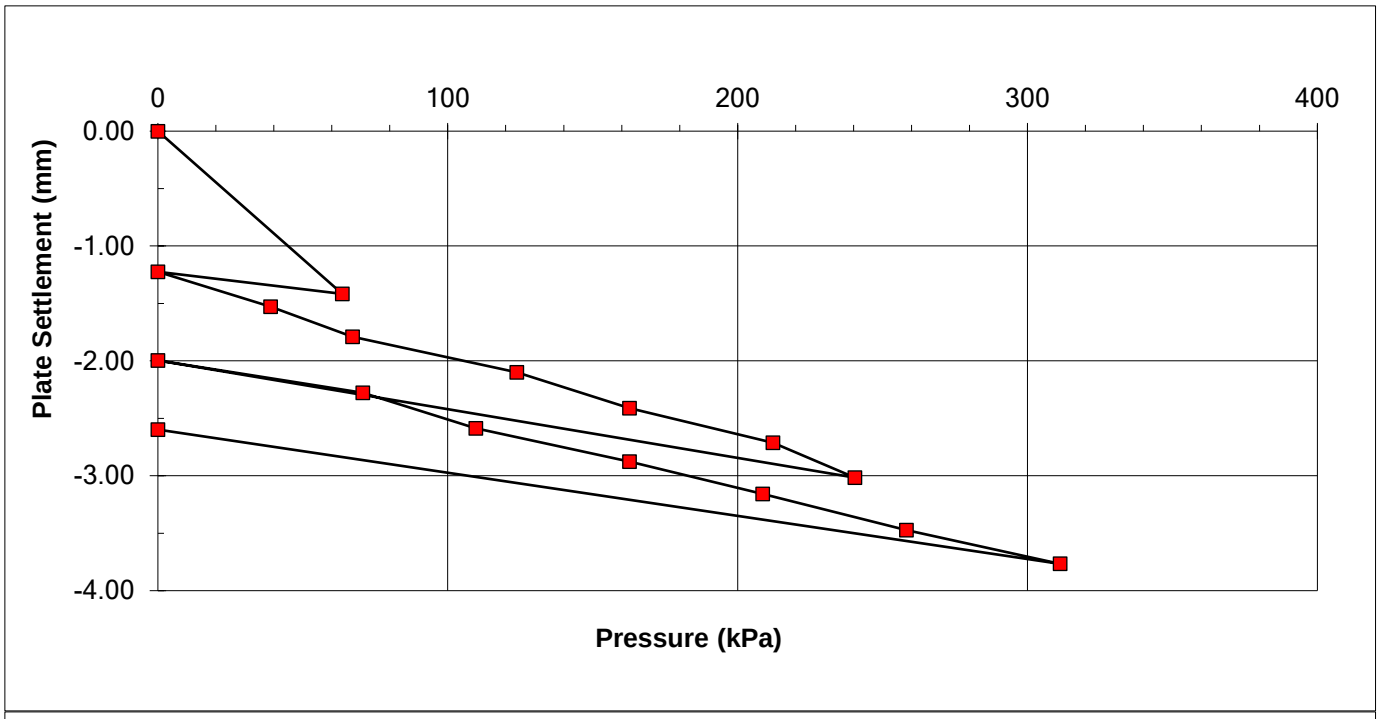
MURRAY RIX

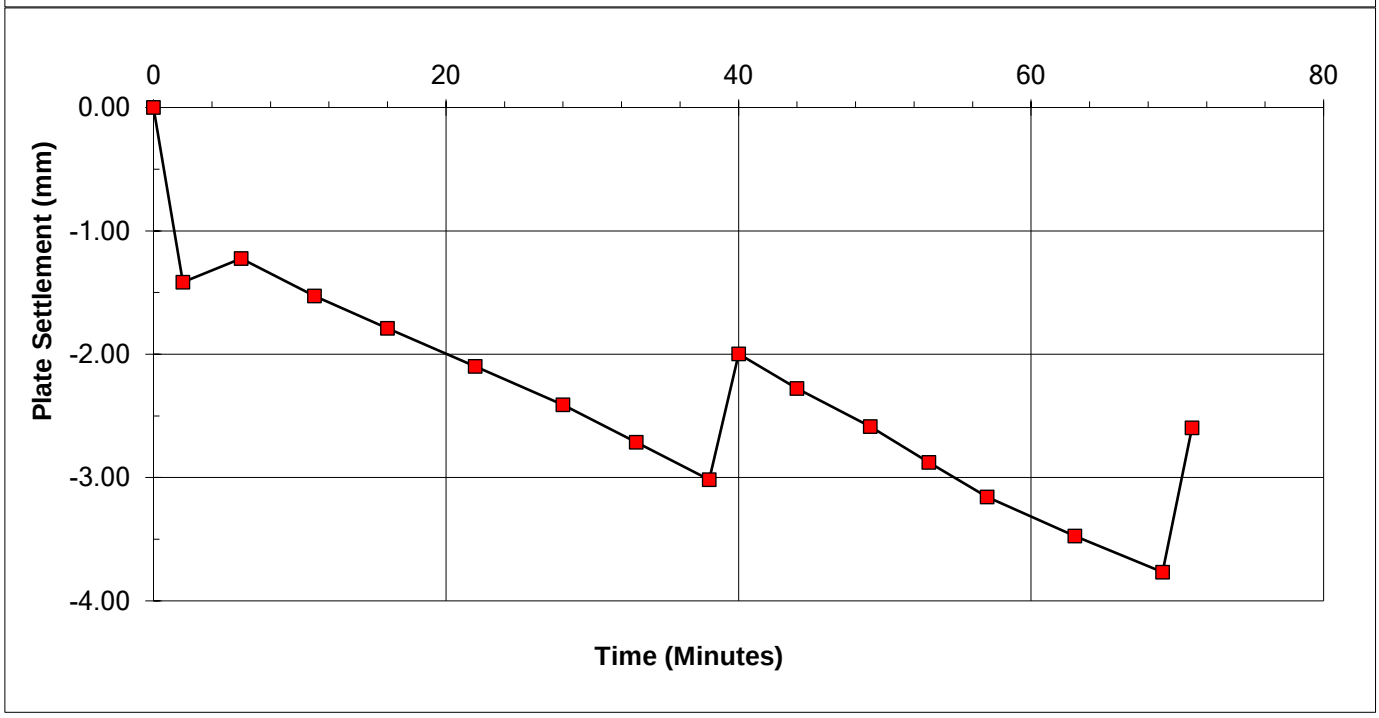
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 07-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/70		
TEST LOCATION	Test 02	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	06-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Yellow Gravel	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4663	4630	4611	4635	0.00	0.00	0.0
4505	4494	4456	4485	-1.50	20.00	70.7
4565	4541	4491	4532	-1.02	0.00	0.0
4540	4515	4453	4503	-1.32	8.00	28.3
4506	4486	4428	4473	-1.61	12.00	42.4
4480	4453	4398	4444	-1.91	19.00	67.2
4454	4426	4367	4416	-2.19	29.00	102.6
4421	4397	4337	4385	-2.50	39.00	137.9
4392	4363	4308	4354	-2.80	50.00	176.8
4467	4449	4510	4475	-1.59	0.00	0.0
4439	4428	4483	4450	-1.85	4.00	14.1
4411	4402	4458	4424	-2.11	7.00	24.8
4386	4380	4424	4397	-2.38	18.00	63.7
4358	4353	4393	4368	-2.67	31.00	109.6
4328	4321	4365	4338	-2.97	51.00	180.4
4299	4295	4338	4311	-3.24	60.00	212.2
4414	4384	4460	4419	-2.15	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	112	kPa
Modulus of subgrade reaction (k) =	90	MPa/m
Equivalent 762 mm plate reaction =	72	MPa/m
Equivalent CBR =	16.0	%
Surface Stiffness Modulus (E) =	104	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	151	kPa
Modulus of subgrade reaction (k) =	121	MPa/m
Equivalent 762 mm plate reaction =	97	MPa/m
Equivalent CBR =	26.9	%
Surface Stiffness Modulus (E) =	145	MN/m^2

Surface Stiffness Modulus Ratio =	1.4

DATE 07-Oct-22

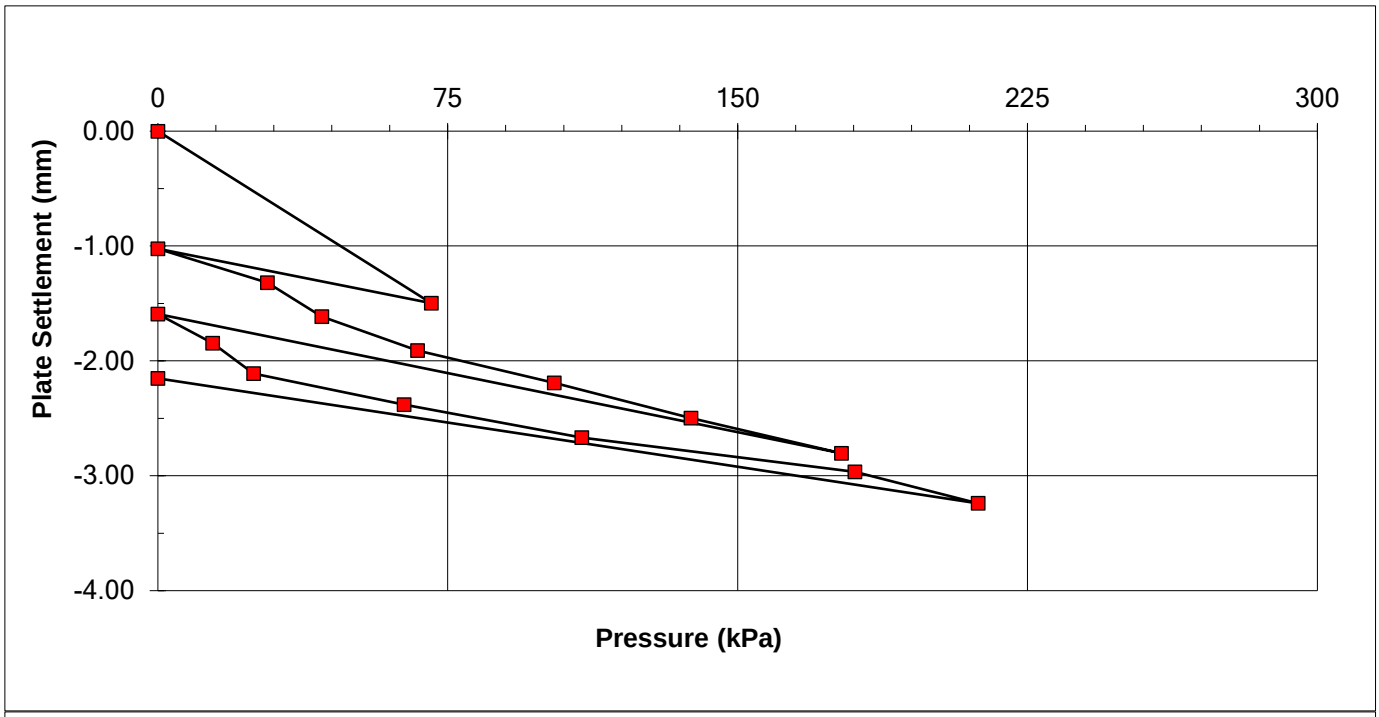
MURRAY RIX

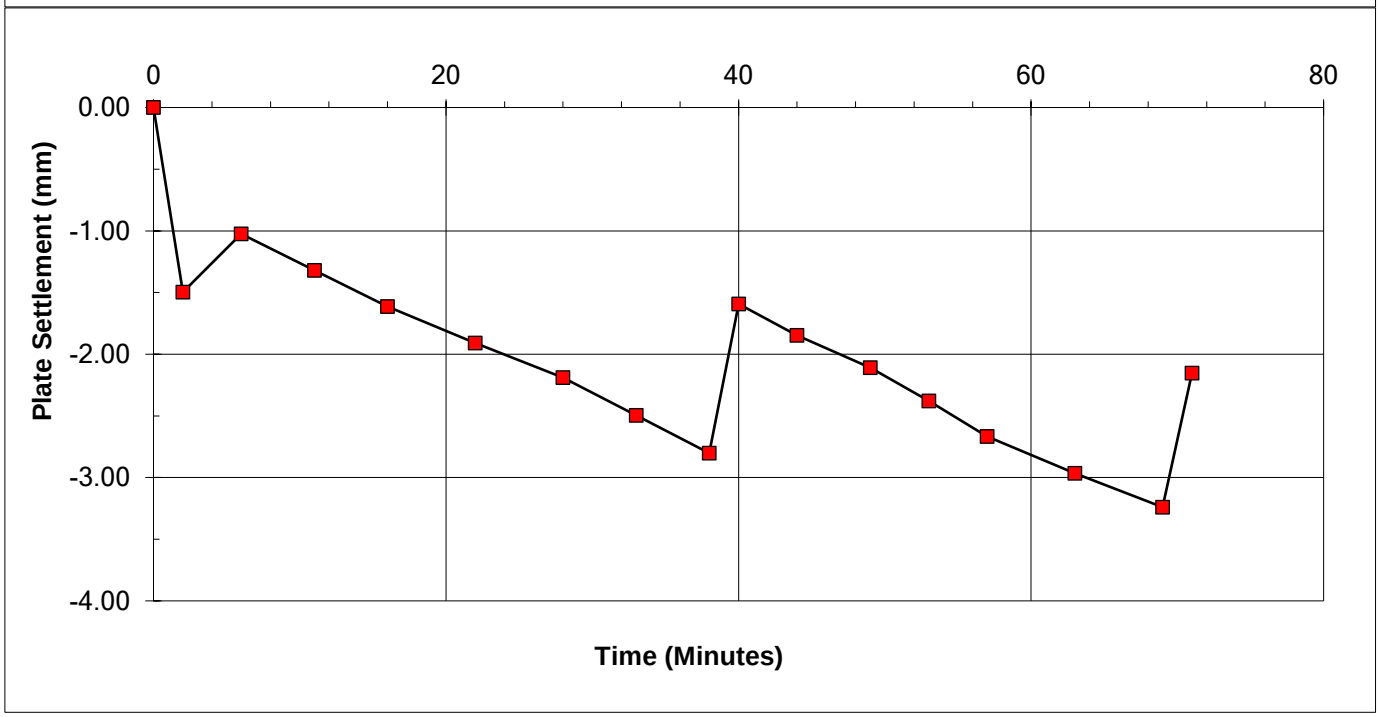
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 07-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/71
Date of Issue 13 October 2022
Page 1 of 11

Approved Signatories

S J Hutchings, O P Davies

Notes

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

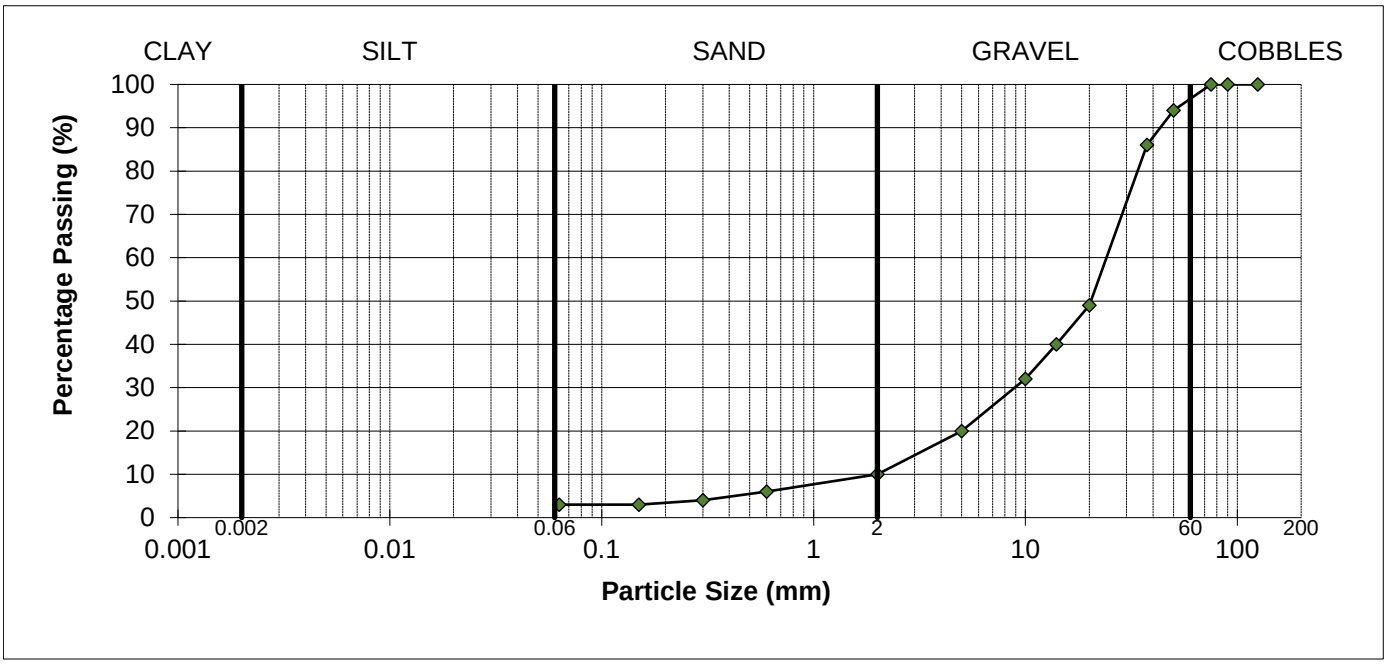
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Tarmac Crush-S	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116455	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	32	
90	100		5	20	
75	100		2	10	
50	94		0.6	6	
37.5	86		0.3	4	
20	49		0.15	3	
14	40		0.063	3	



REMARKS
As received moisture content = 2.0%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

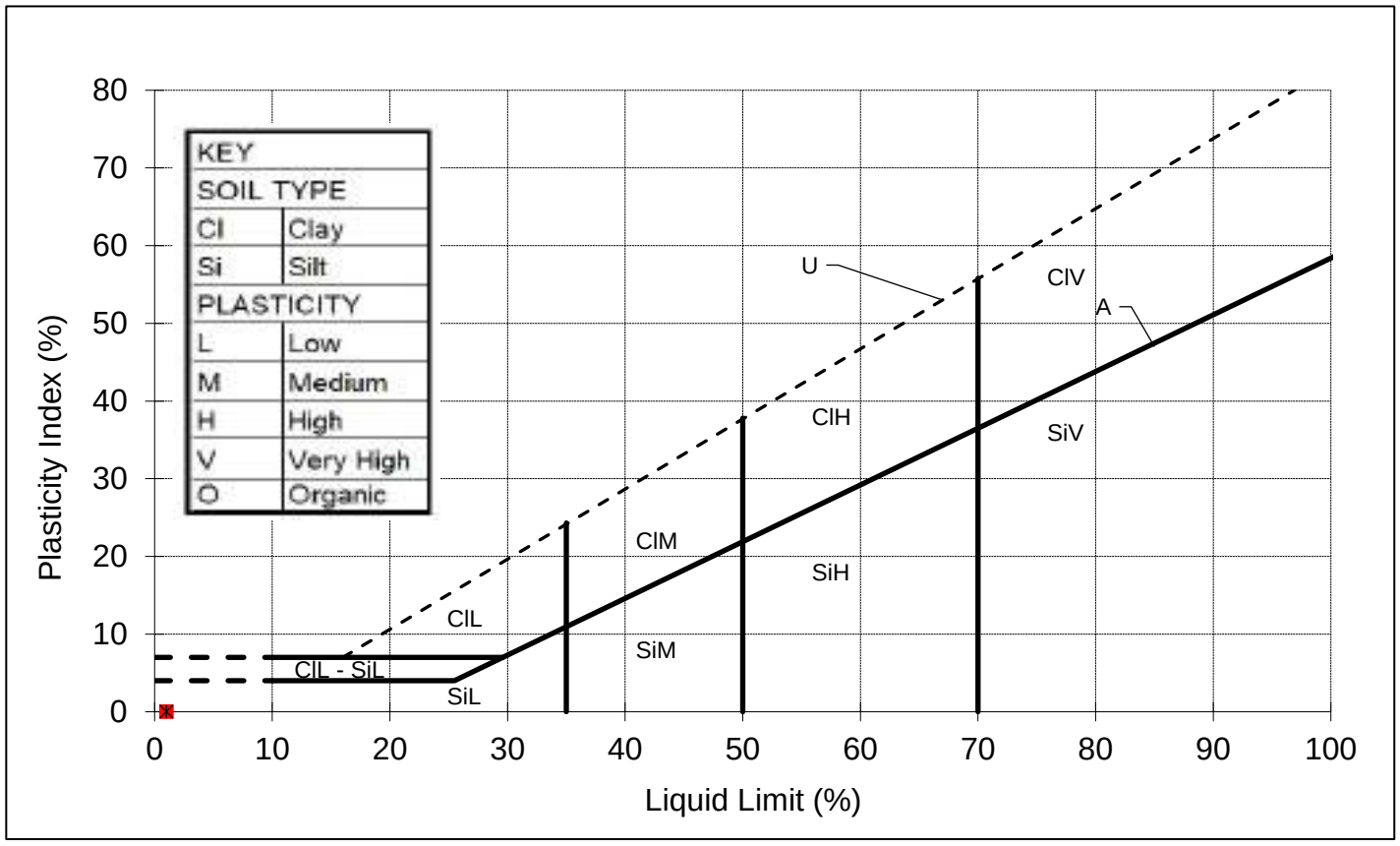
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Tarmac Crush-S	DATE SAMPLED	05-Sep-22
SAMPLE No.	116455	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
2.0	N/A	Non Plastic	N/A	5



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

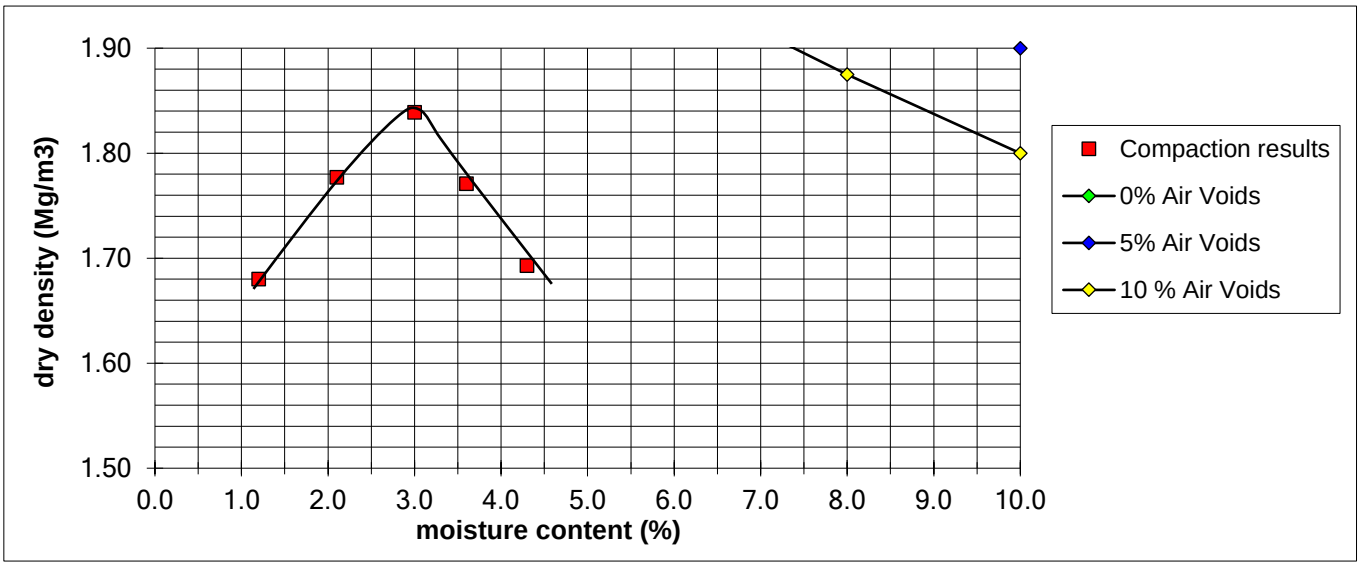
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Tarmac Crush-S	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116455	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	1.2	1.680
2	2.1	1.777
3	3.0	1.839
4	3.6	1.771
5	4.3	1.693
Optimum	3.0	
Maximum		1.84
Particle Density	2.5 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 14%
Percentage of material retained on 20mm sieve = 51%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF RESISTANCE TO FRAGMENTATION BY THE LOS ANGELES TEST METHOD

BS EN 1097-2:2020

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

SAMPLE DETAILS

Job Number	:	MRN 4454/71
Laboratory sample number	:	116455
Material	:	Recycled Crush
Advised source	:	Site Won - SP D11
Site mark	:	SP-Tarmac Crush-S
Certificate of sampling received	:	No
Date and time of sampling	:	05-Sep-22
Date received at Laboratory	:	06-Sep-22
Date of start of test	:	15-Sep-22
Sampling Location	:	Site
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Size Fraction	:	35% passing 14mm retained 12.5mm 65% passing 12.5mm retained 10mm
Mass of dry sample tested	:	5000g
Target specification	:	<50

RESULT

Los Angeles Coefficient	:	**40**

Comment

NAME O.P. Davies BA (Hons (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

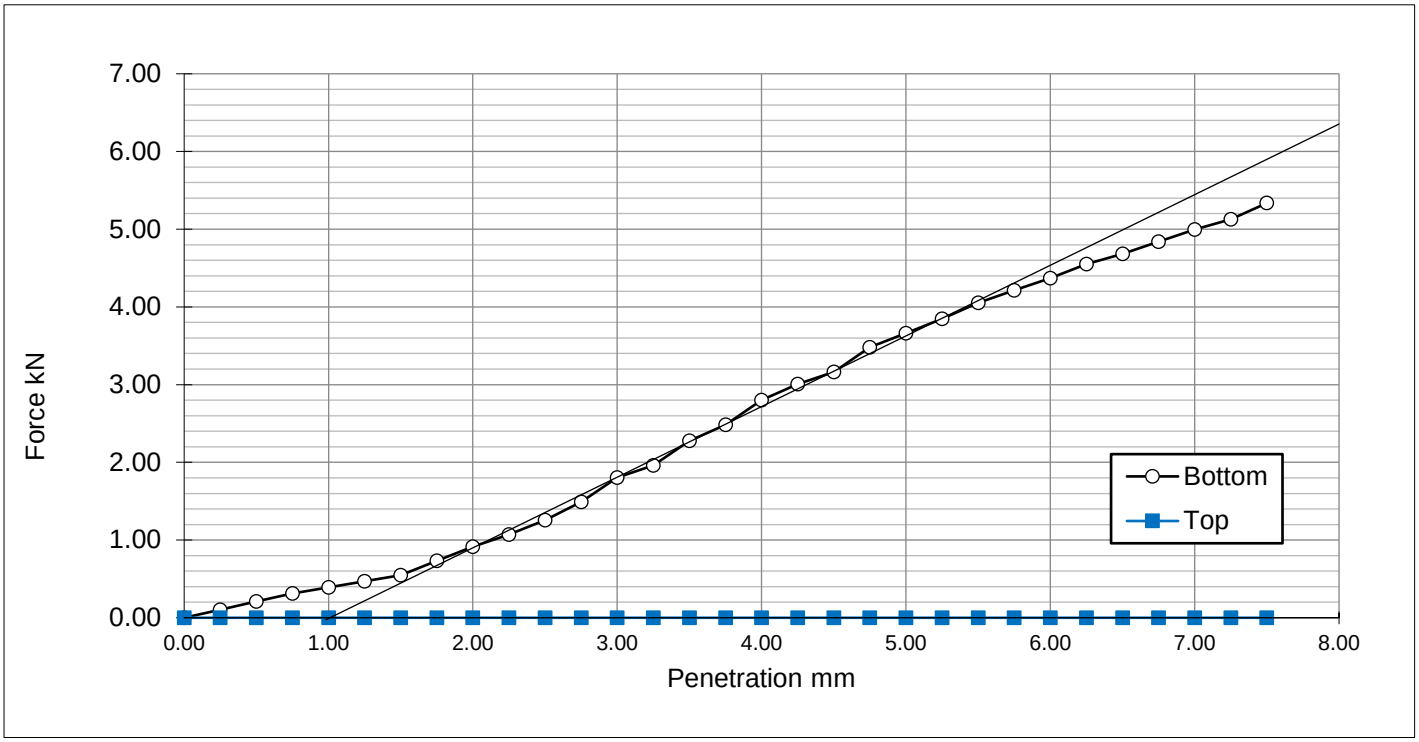
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Tarmac Crush-S	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116455	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		51 %			
BULK DENSITY	1.90 Mg/m3	MOISTURE CONTENT	3.0 %	DRY DENSITY	1.84 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	22	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	3.0	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

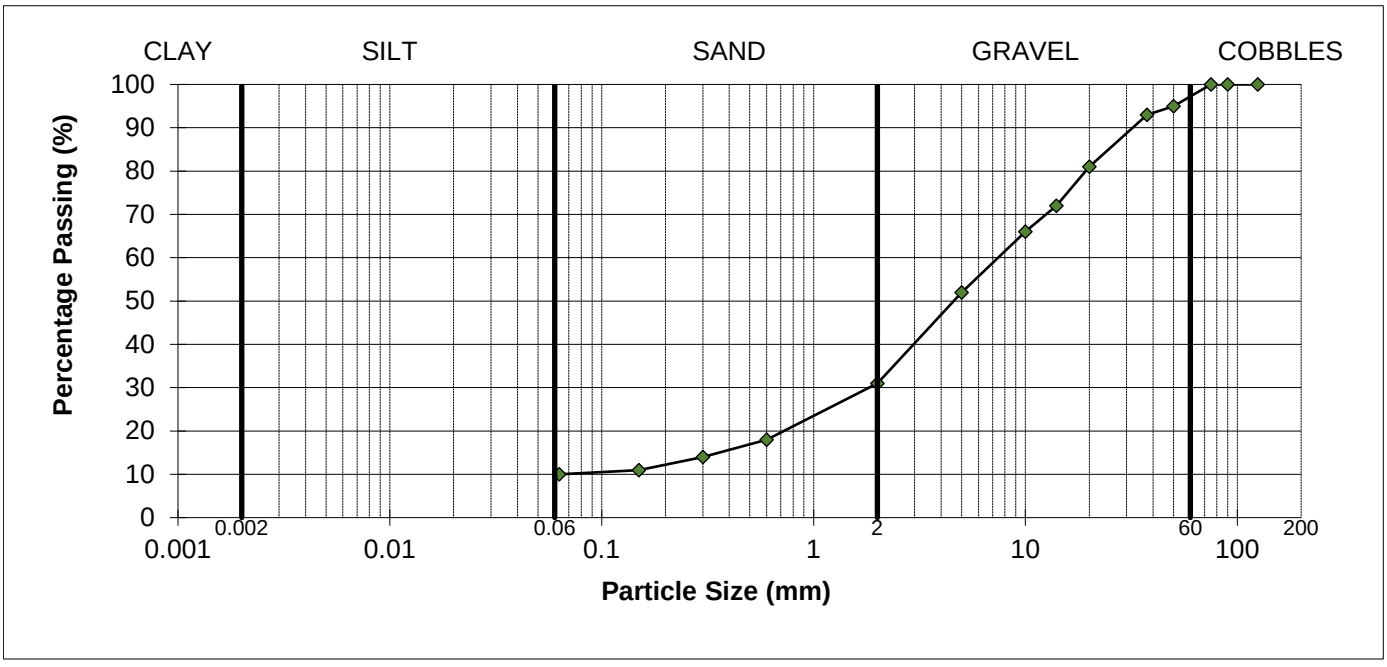
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Concrete Crush-1	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116456	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	66	
90	100		5	52	
75	100		2	31	
50	95		0.6	18	
37.5	93		0.3	14	
20	81		0.15	11	
14	72		0.063	10	



REMARKS
As received moisture content = 4.7%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

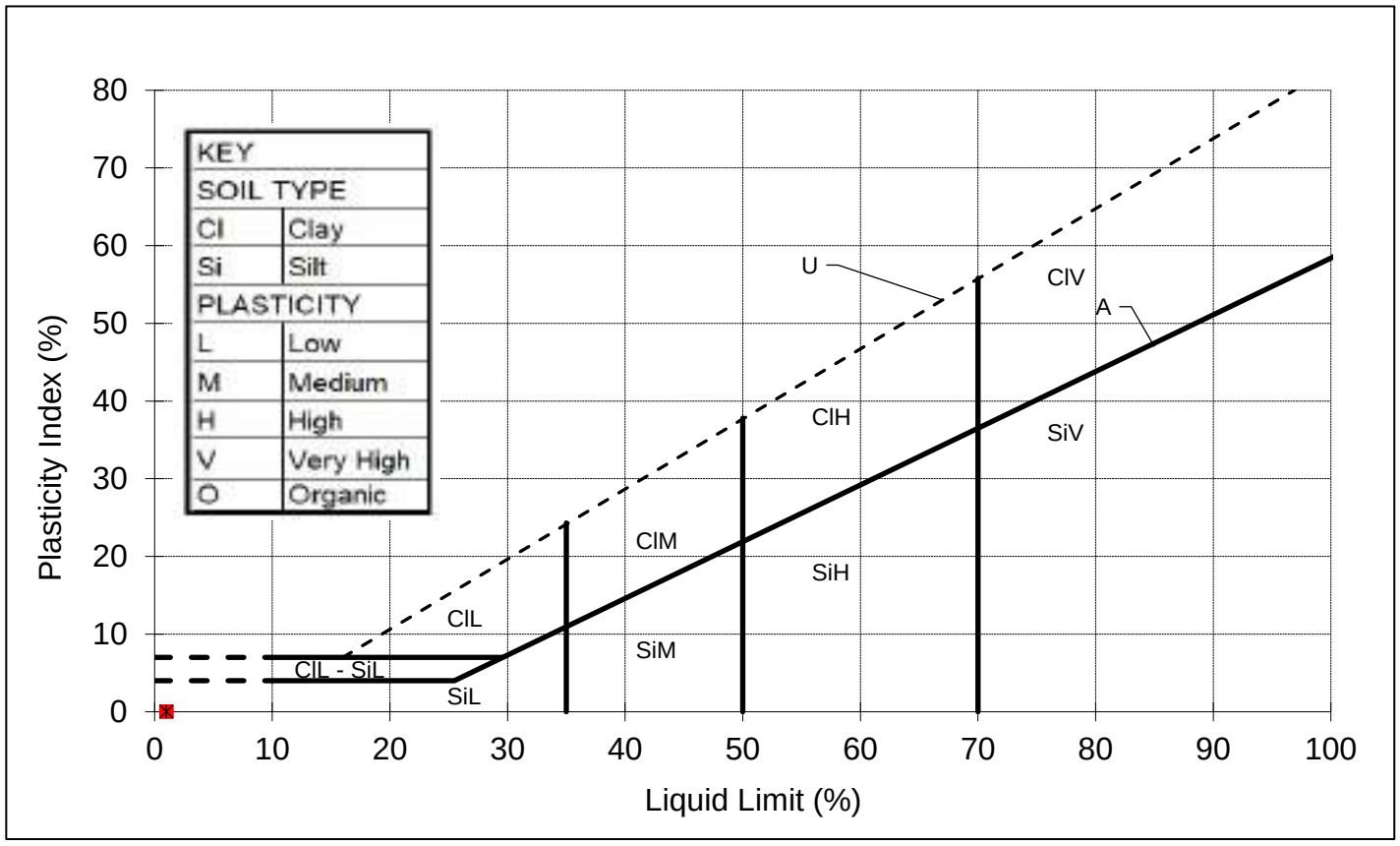
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Concrete Crush-1	DATE SAMPLED	05-Sep-22
SAMPLE No.	116456	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
4.7	N/A	Non Plastic	N/A	16



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

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ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

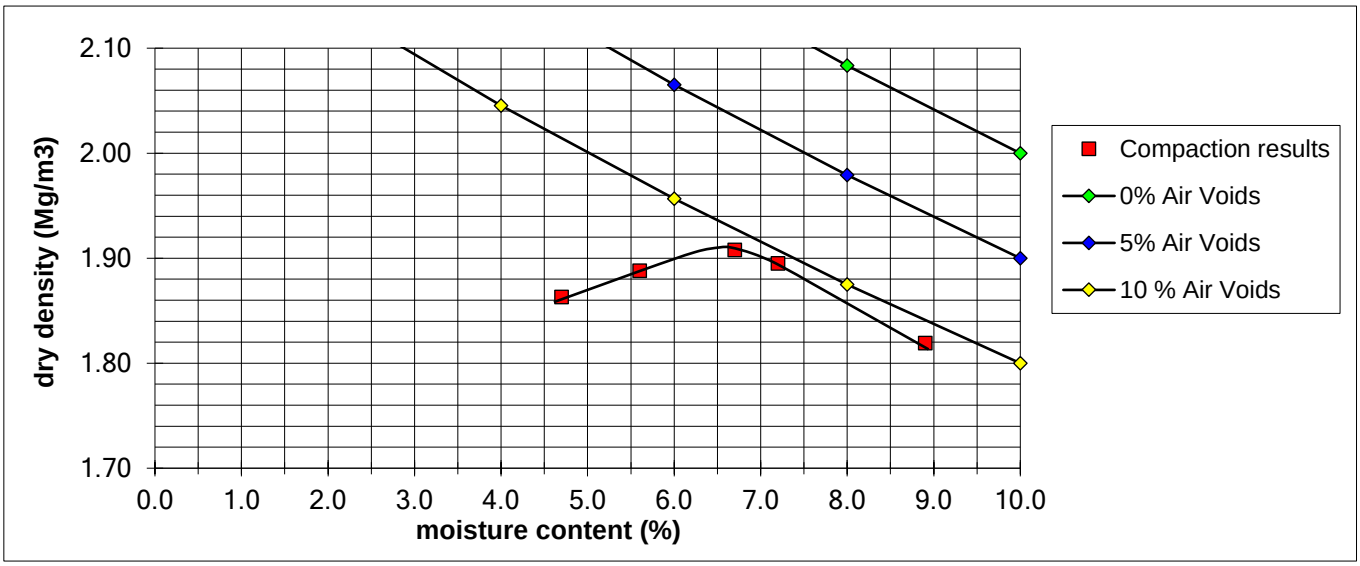
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Concrete Crush-1	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116456	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		4.7	1.863
2		5.6	1.888
3		6.7	1.908
4		7.2	1.895
5		8.9	1.819
	Optimum	6.6	
	Maximum		1.91
	Particle Density	2.5 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 7%
Percentage of material retained on 20mm sieve = 19%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF RESISTANCE TO FRAGMENTATION BY THE LOS ANGELES TEST METHOD

BS EN 1097-2:2020

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

SAMPLE DETAILS

Job Number	:	MRN 4454/71
Laboratory sample number	:	116456
Material	:	Recycled Crush
Advised source	:	Site Won - SP D11
Site mark	:	SP-Concrete Crush-1
Certificate of sampling received	:	No
Date and time of sampling	:	05-Sep-22
Date received at Laboratory	:	06-Sep-22
Date of start of test	:	15-Sep-22
Sampling Location	:	Site
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Size Fraction	:	32% passing 14mm retained 12.5mm
		68% passing 12.5mm retained 10mm
Mass of dry sample tested	:	5000g
Target specification	:	<50

RESULT

Los Angeles Coefficient	:	**44**

Comment

NAME O.P. Davies BA (Hons (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

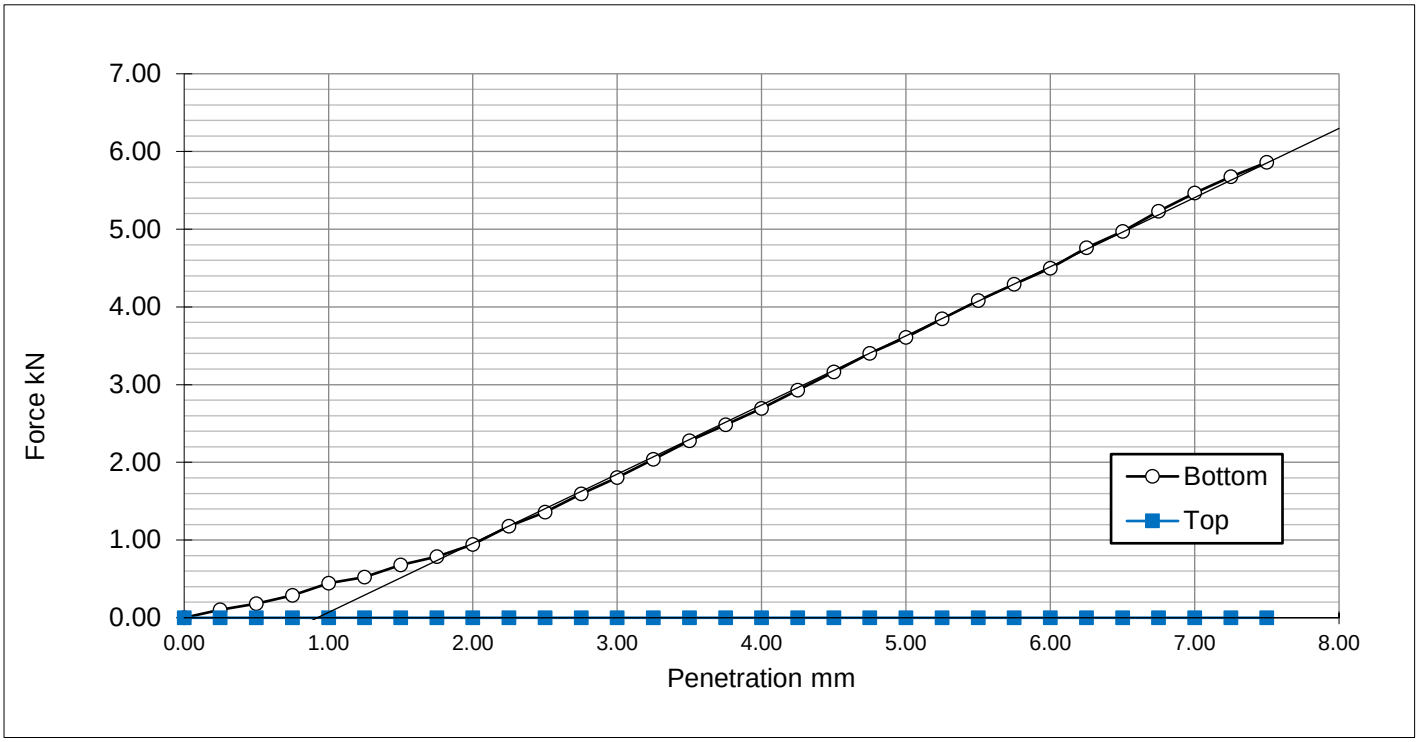
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/71

SAMPLE LABEL	SP-Conrete Crush-1	DATE SAMPLED	05-Sep-22
LAB SAMPLE No	116456	DATE RECEIVED	06-Sep-22
DATE TESTED	15-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		19 %			
BULK DENSITY	2.04 Mg/m3	MOISTURE CONTENT	6.6 %	DRY DENSITY	1.91 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	22	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	6.6	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/72
Date of Issue 13 October 2022
Page 1 of 8

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

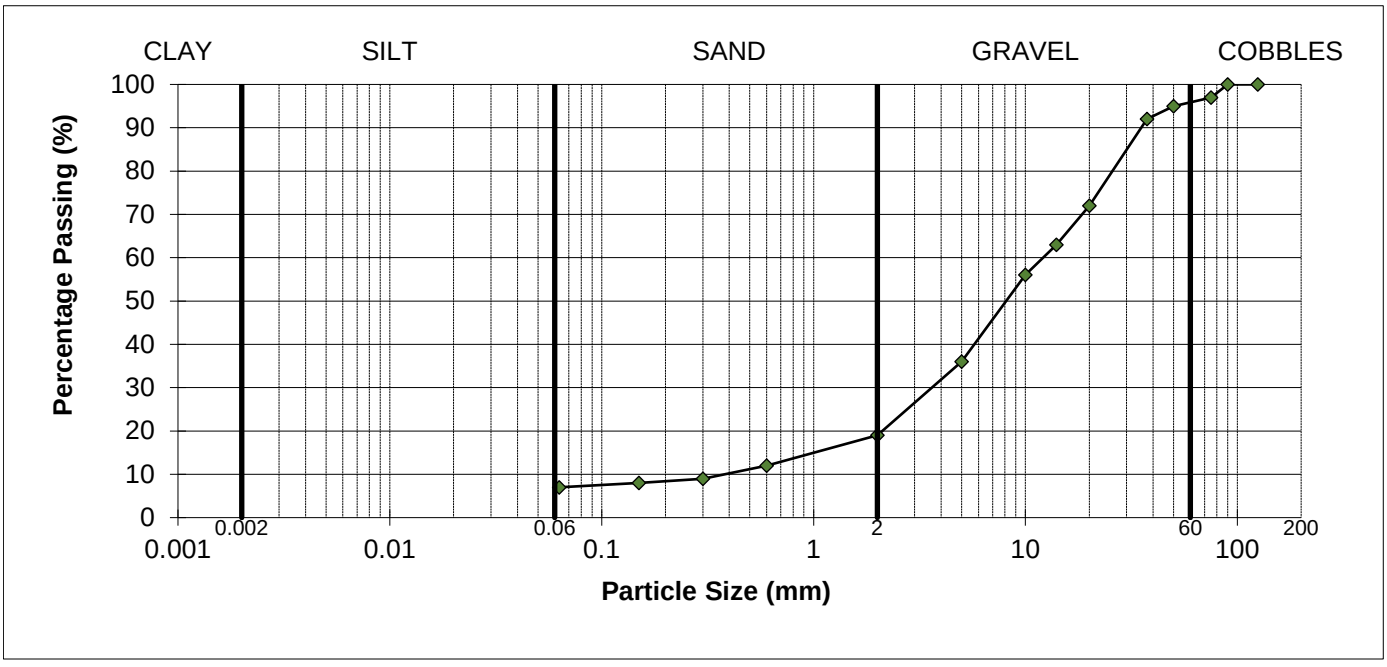
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-1	DATE SAMPLED	12-Sep-22
LAB SAMPLE No	116605	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	56	
90	100		5	36	
75	97		2	19	
50	95		0.6	12	
37.5	92		0.3	9	
20	72		0.15	8	
14	63		0.063	7	



REMARKS
As received moisture content = 6.6%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

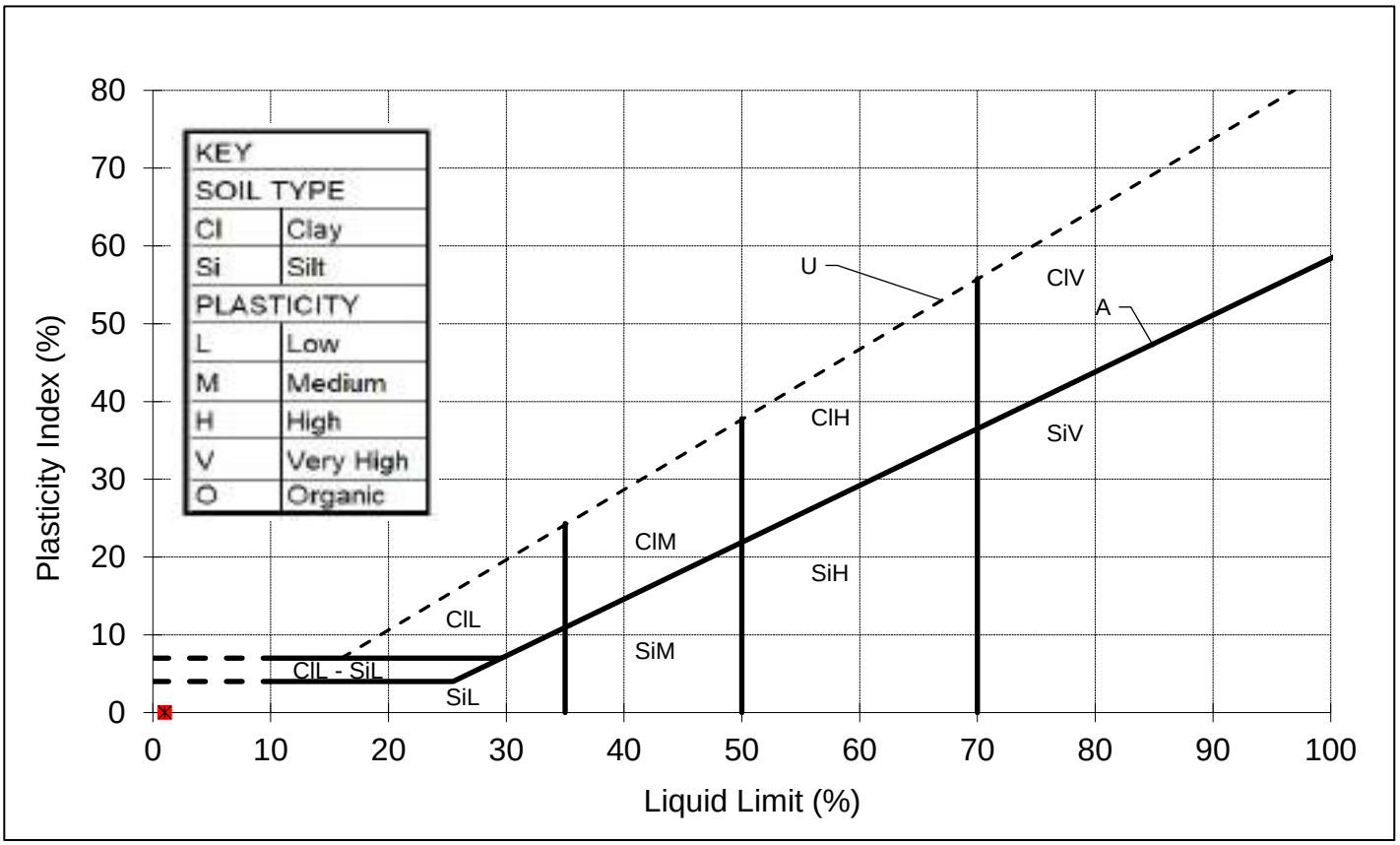
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-1	DATE SAMPLED	12-Sep-22
SAMPLE No.	116605	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
6.6	N/A	Non Plastic	N/A	10



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

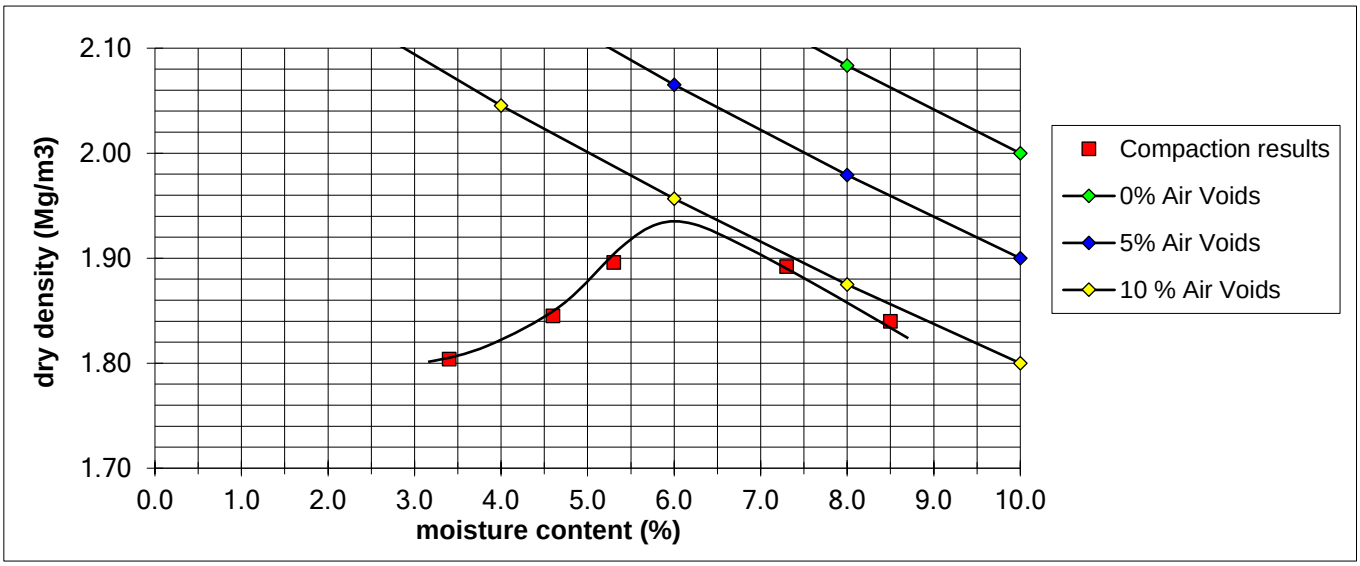
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-1	DATE SAMPLED	12-Sep-22
LAB SAMPLE No	116605	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		3.4	1.804
2		4.6	1.845
3		5.3	1.896
4		7.3	1.892
5		8.5	1.840
	Optimum	6.0	
	Maximum		1.93
	Particle Density	2.5 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 8%
Percentage of material retained on 20mm sieve = 28%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF RESISTANCE TO FRAGMENTATION BY THE LOS ANGELES TEST METHOD

BS EN 1097-2:2020

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

SAMPLE DETAILS

Job Number	:	MRN 4454/72
Laboratory sample number	:	116605
Material	:	Recycled Crush
Advised source	:	Site Won - SP D11
Site mark	:	SP-6F2 Mix-1
Certificate of sampling received	:	No
Date and time of sampling	:	12-Sep-22
Date received at Laboratory	:	12-Sep-22
Date of start of test	:	20-Sep-22
Sampling Location	:	Site
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Size Fraction	:	37% passing 14mm retained 12.5mm 63% passing 12.5mm retained 10mm
Mass of dry sample tested	:	5000g
Target specification	:	<50

RESULT

Los Angeles Coefficient	:	**42**

Comment

NAME O.P. Davies BA (Hons (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

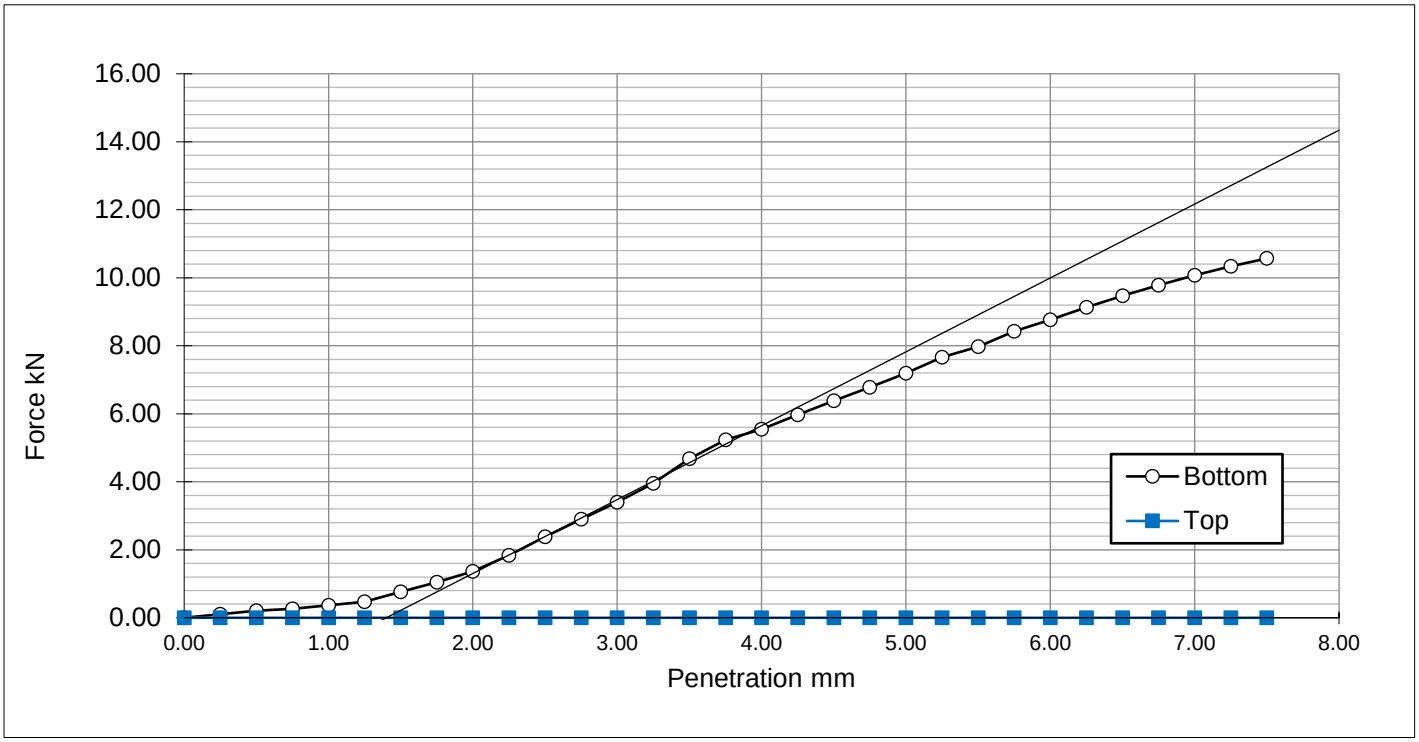
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-1	DATE SAMPLED	12-Sep-22
LAB SAMPLE No	116605	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Density, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		28 %			
BULK DENSITY	2.05 Mg/m3	MOISTURE CONTENT	6.0 %	DRY DENSITY	1.93 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	47	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	6.0	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

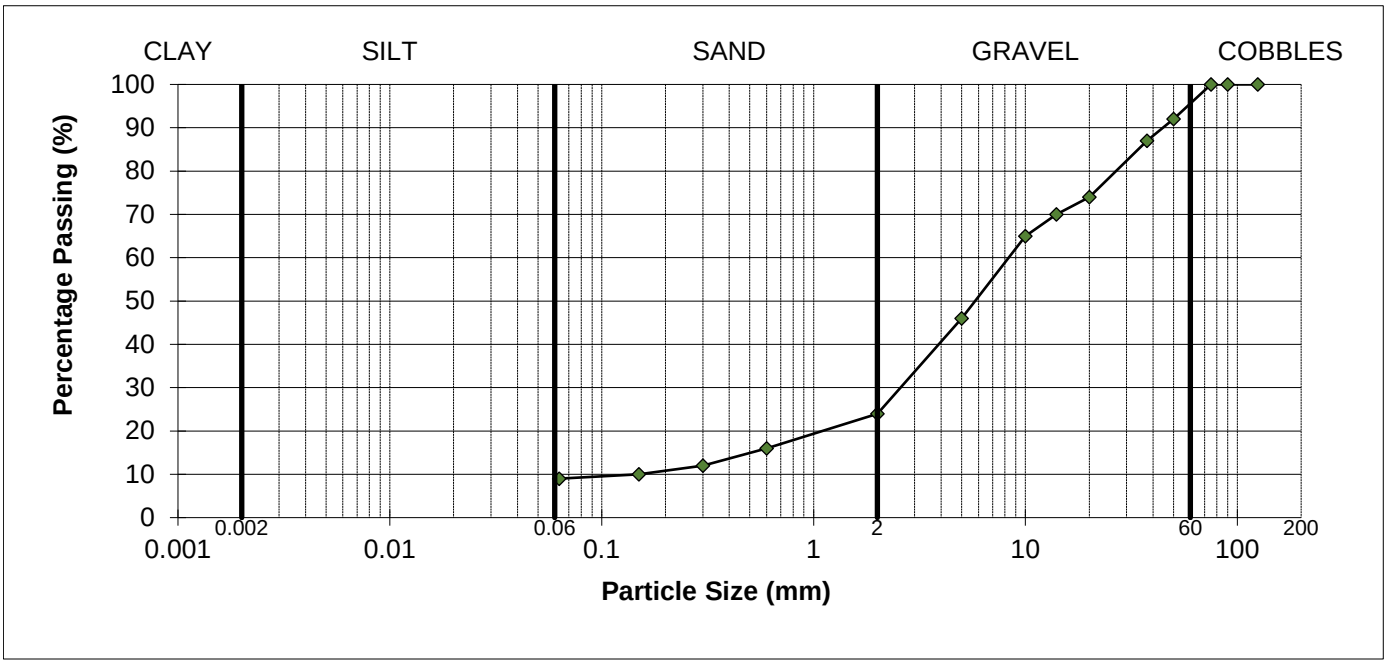
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-2	DATE SAMPLED	12-Sep-22
LAB SAMPLE No	116606	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	65	
90	100		5	46	
75	100		2	24	
50	92		0.6	16	
37.5	87		0.3	12	
20	74		0.15	10	
14	70		0.063	9	



REMARKS
As received moisture content = 6.9%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

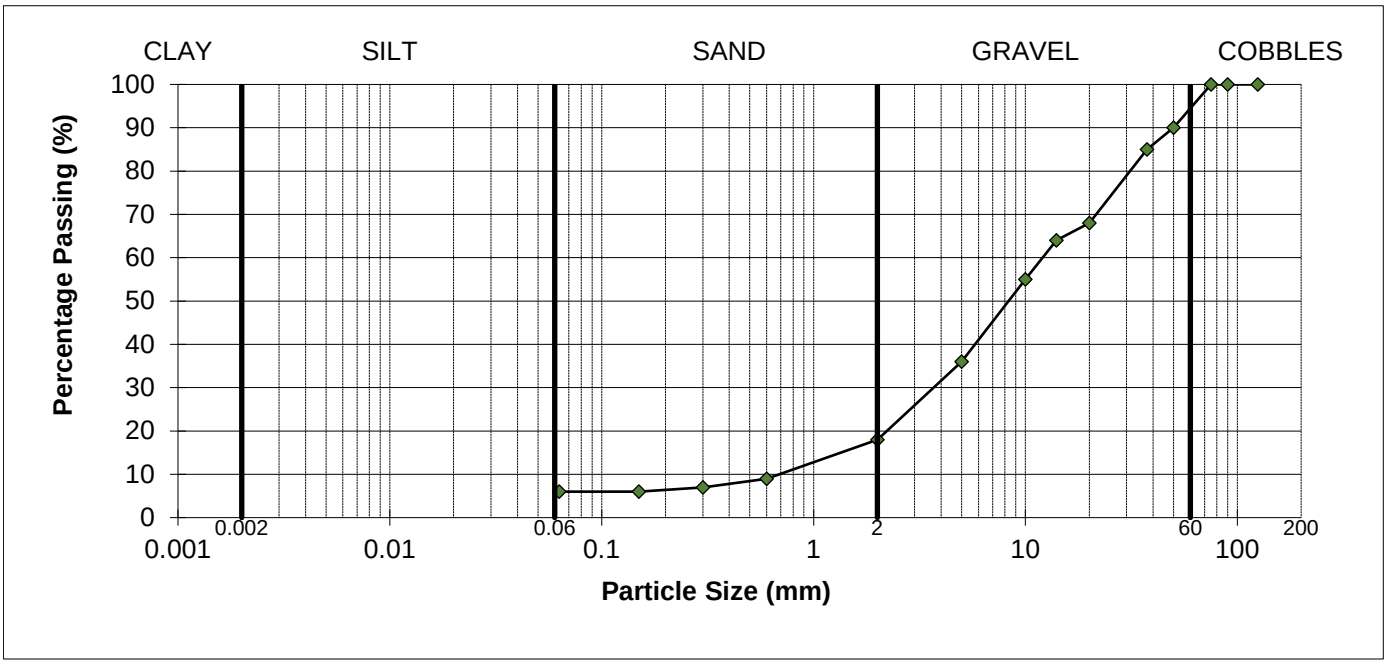
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/72

SAMPLE LABEL	SP-6F2 Mix-3	DATE SAMPLED	12-Sep-22
LAB SAMPLE No	116607	DATE RECEIVED	12-Sep-22
DATE TESTED	20-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP D11

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	55	
90	100		5	36	
75	100		2	18	
50	90		0.6	9	
37.5	85		0.3	7	
20	68		0.15	6	
14	64		0.063	6	



REMARKS
As received moisture content = 6.9%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/73
Date of Issue 13 October 2022
Page 1 of 11

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

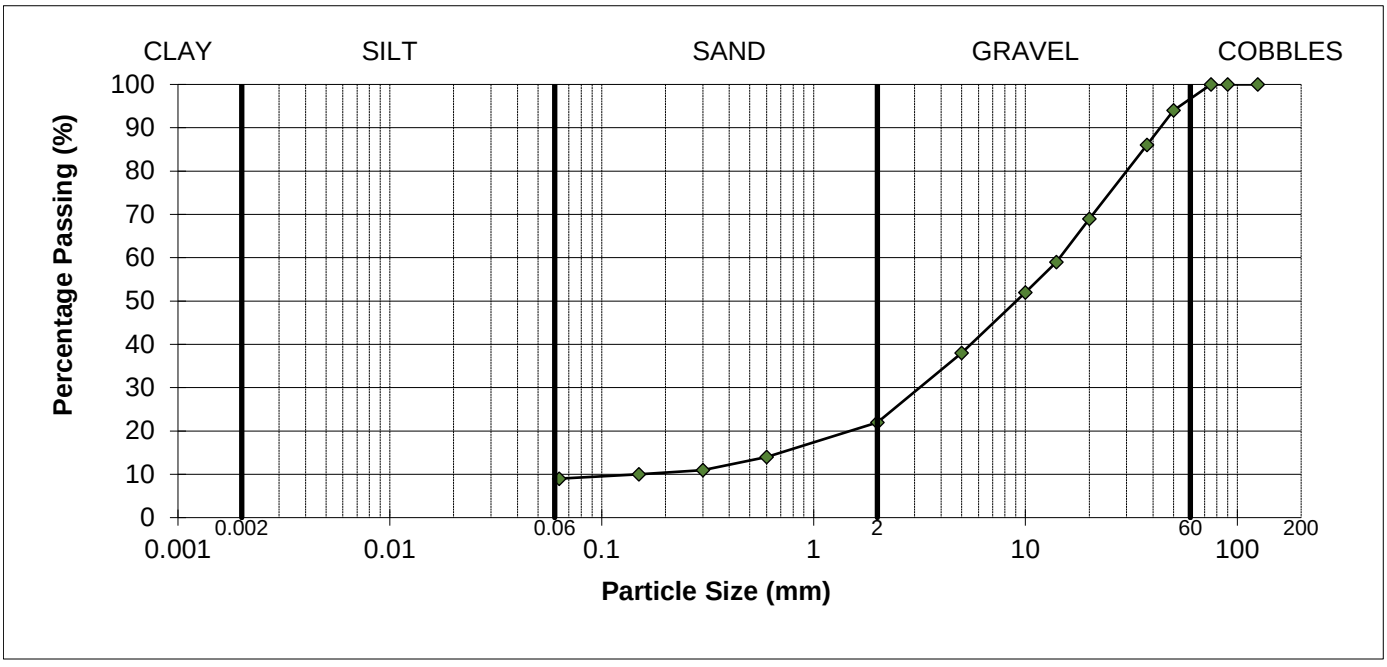
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-4	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116975	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	52	
90	100		5	38	
75	100		2	22	
50	94		0.6	14	
37.5	86		0.3	11	
20	69		0.15	10	
14	59		0.063	9	



REMARKS
As received moisture content = 7.3%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

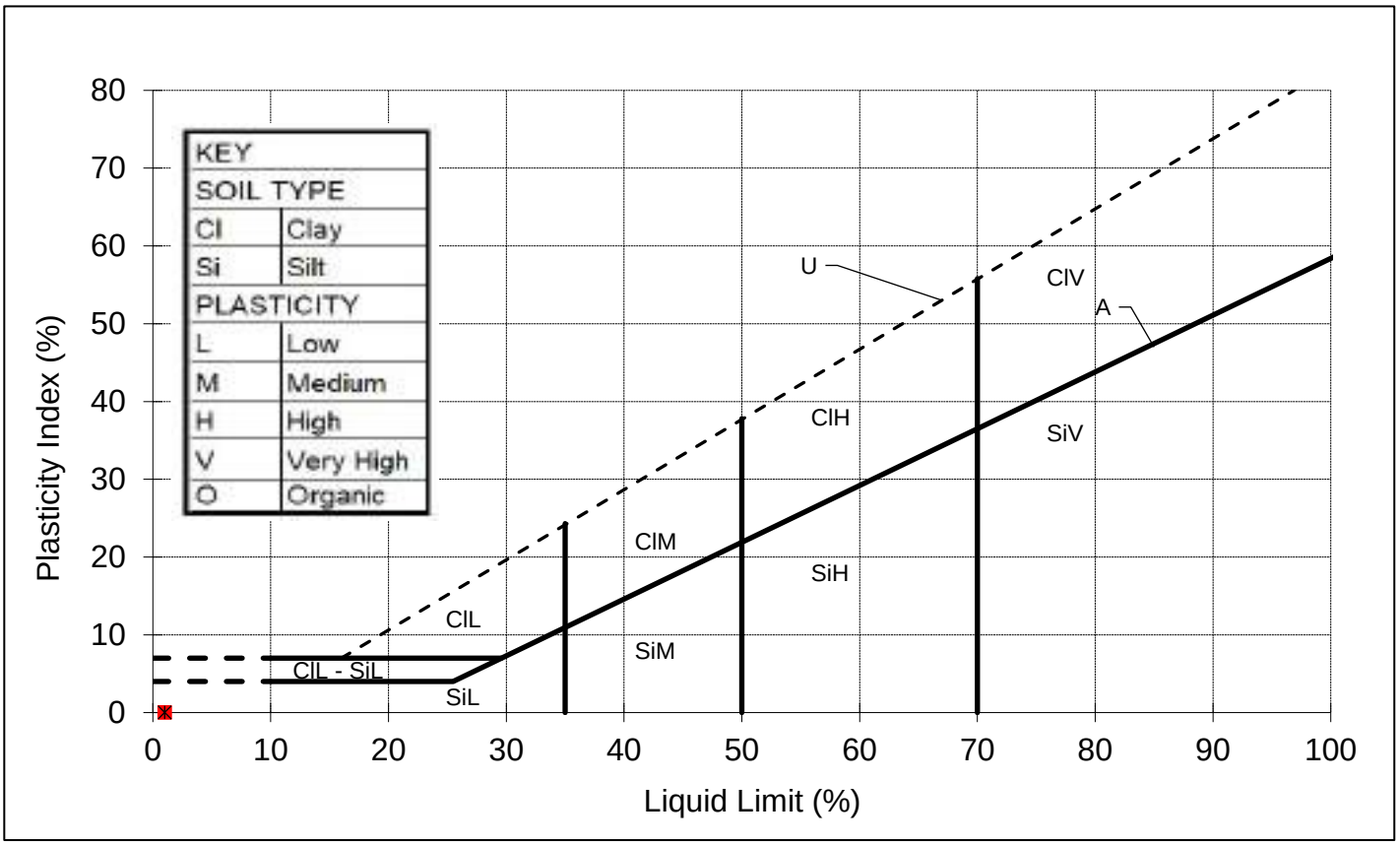
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-4	DATE SAMPLED	23-Sep-22
SAMPLE No.	116975	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
7.3	N/A	Non Plastic	N/A	12



REMARKS
Sample tested after wet sieving.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

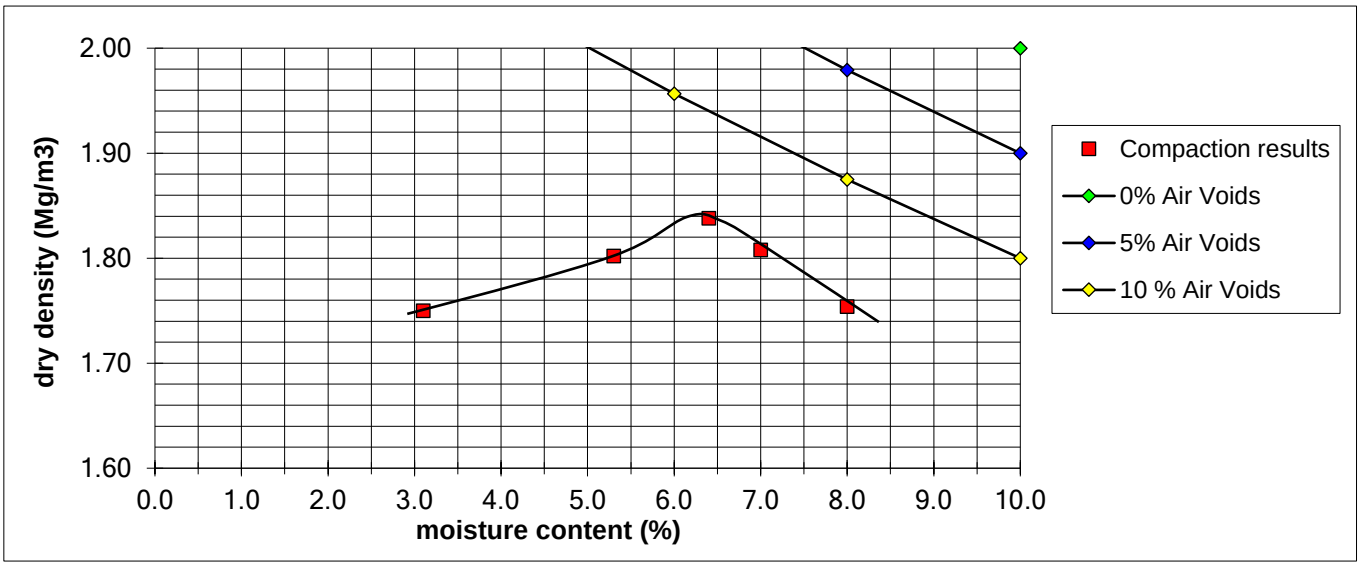
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-4	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116975	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	3.1	1.750
2	5.3	1.802
3	6.4	1.838
4	7.0	1.808
5	8.0	1.754
Optimum	6.2	
Maximum		1.84
Particle Density	2.5 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 14%
Percentage of material retained on 20mm sieve = 31%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

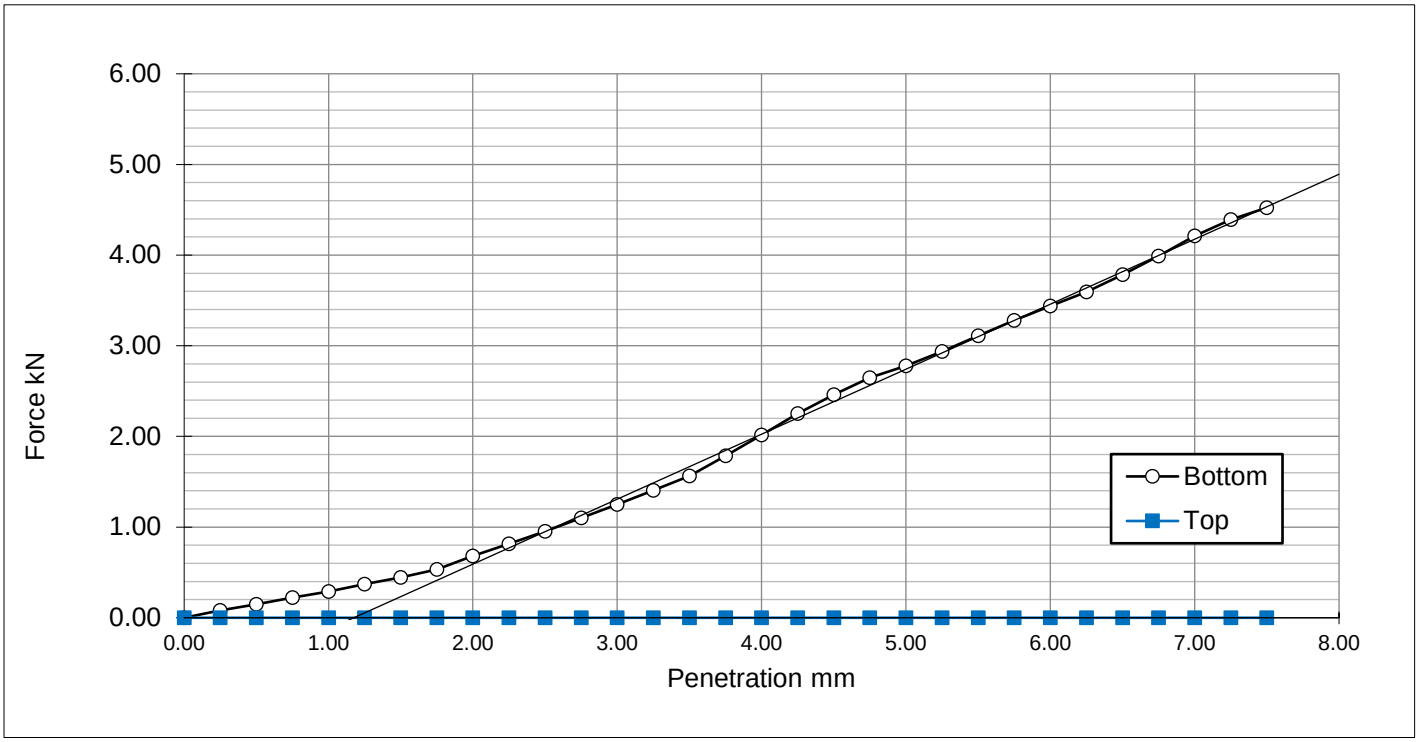
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-4	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116975	DATE RECEIVED	23-Sep-22
DATE TESTED	04-Oct-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, Vibrating Hammer			
GREATER THAN 20 mm REMOVED		31 %			
BULK DENSITY	1.75 Mg/m3	MOISTURE CONTENT	9.4 %	DRY DENSITY	1.60 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	18	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	9.4	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

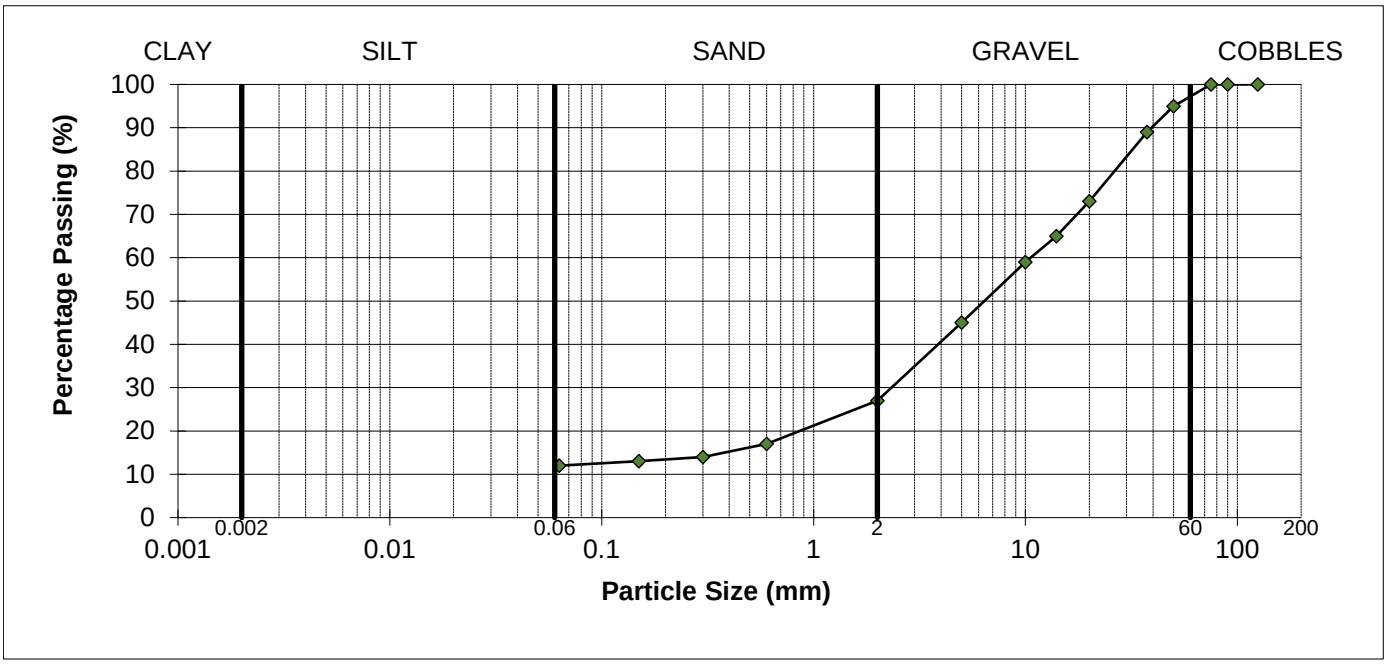
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-5	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116976	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	59	
90	100		5	45	
75	100		2	27	
50	95		0.6	17	
37.5	89		0.3	14	
20	73		0.15	13	
14	65		0.063	12	



REMARKS
As received moisture content = 5.8%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

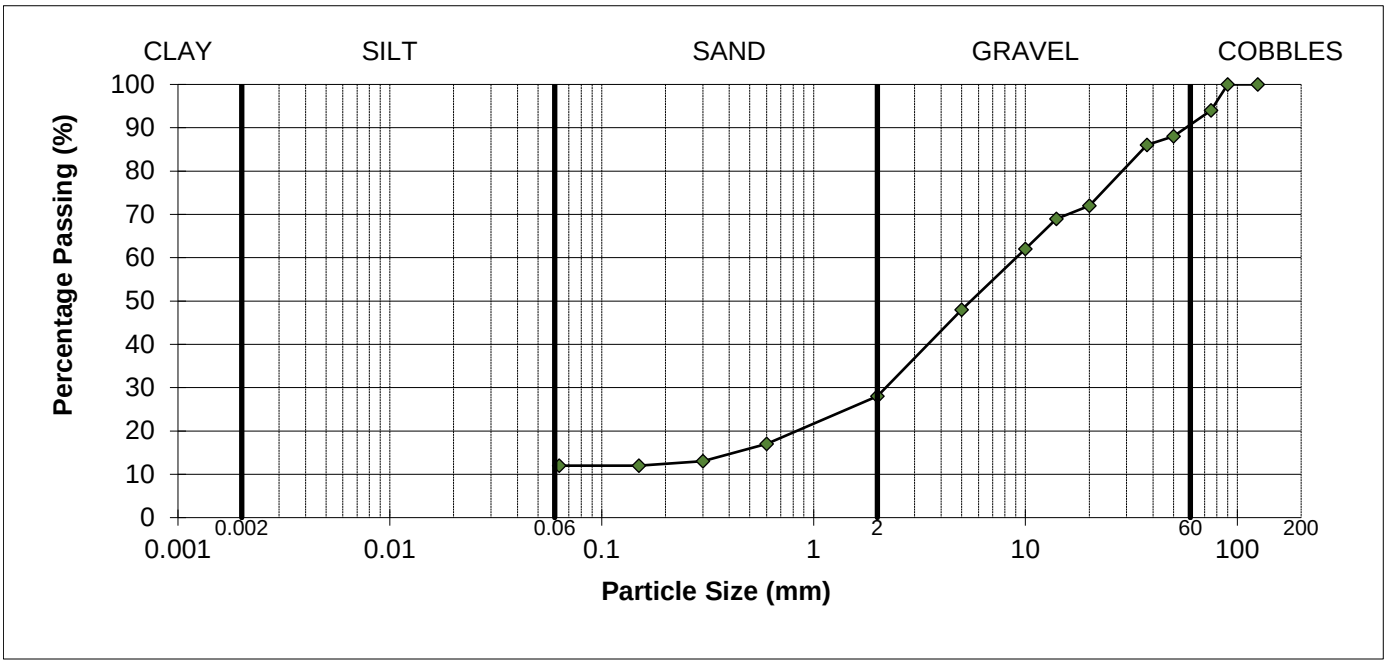
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-6	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116977	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	62	
90	100		5	48	
75	94		2	28	
50	88		0.6	17	
37.5	86		0.3	13	
20	72		0.15	12	
14	69		0.063	12	



REMARKS
As received moisture content = 6.7%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

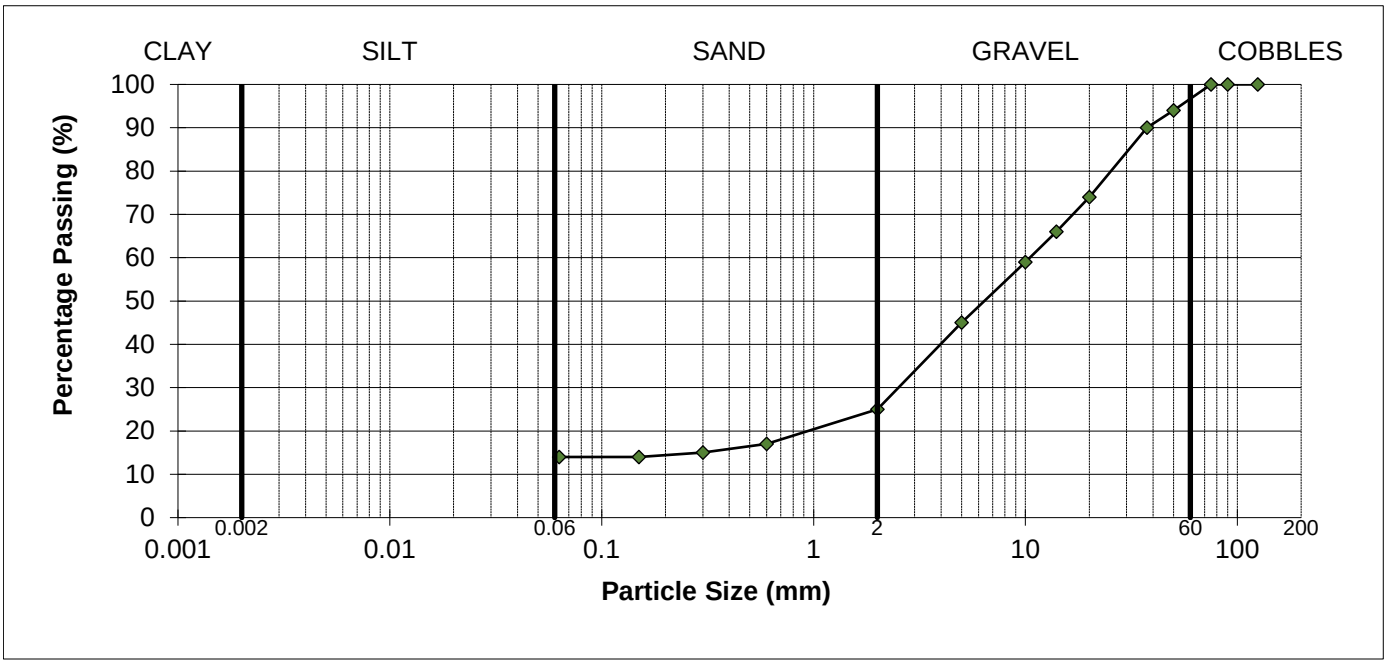
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-7	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116978	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	59	
90	100		5	45	
75	100		2	25	
50	94		0.6	17	
37.5	90		0.3	15	
20	74		0.15	14	
14	66		0.063	14	



REMARKS
As received moisture content = 5.1%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

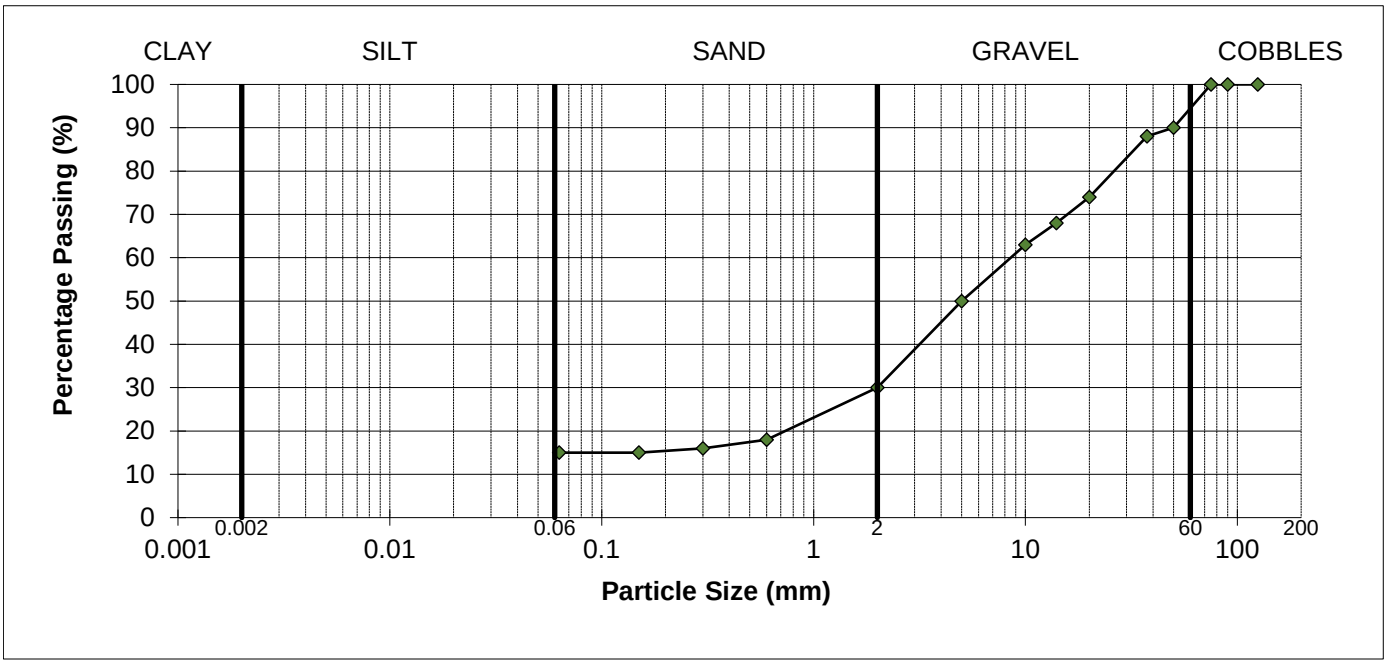
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-8	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116979	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	63	
90	100		5	50	
75	100		2	30	
50	90		0.6	18	
37.5	88		0.3	16	
20	74		0.15	15	
14	68		0.063	15	



REMARKS
As received moisture content = 6.2%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

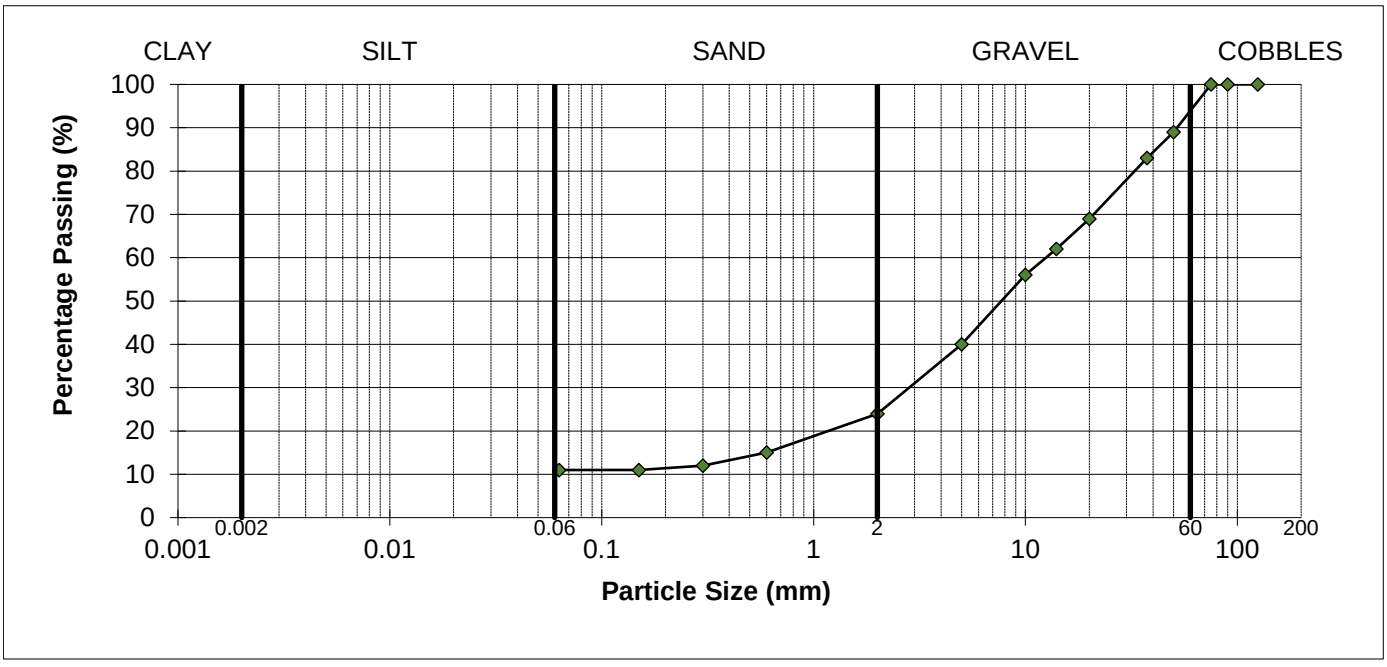
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-9	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116980	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	56	
90	100		5	40	
75	100		2	24	
50	89		0.6	15	
37.5	83		0.3	12	
20	69		0.15	11	
14	62		0.063	11	



REMARKS
As received moisture content = 6.8%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

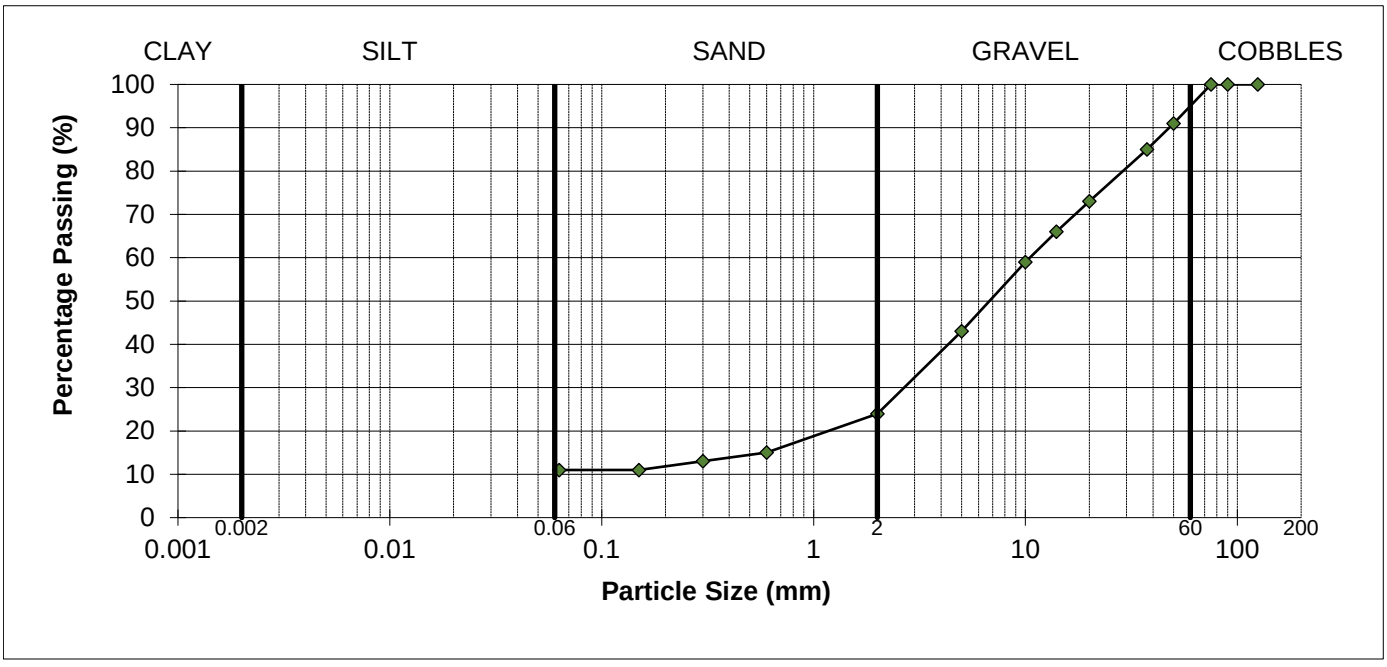
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NF
JOB NUMBER	MRN 4454/73

SAMPLE LABEL	SP-6F2 Mix-10	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	116981	DATE RECEIVED	23-Sep-22
DATE TESTED	28-Sep-22	SAMPLED BY	Client

MATERIAL	Recycled Crush
ADVISED SOURCE	Site Won - SP 6F2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	59	
90	100		5	43	
75	100		2	24	
50	91		0.6	15	
37.5	85		0.3	13	
20	73		0.15	11	
14	66		0.063	11	



REMARKS
As received moisture content = 5.6%, Uniformity coefficient =>10

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/74
Date of Issue 13 October 2022
Page 1 of 16

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

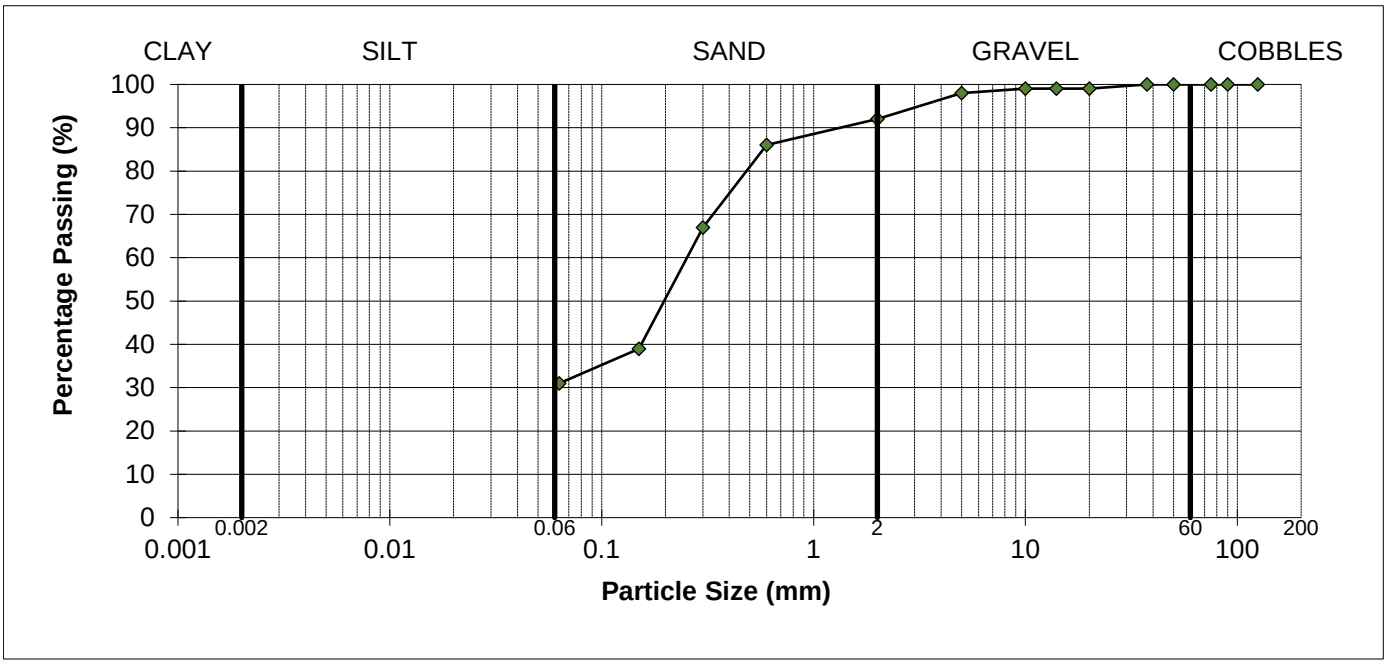
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - E16 - 1.5m	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116657	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - 1.5m, E16

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	99	
90	100		5	98	
75	100		2	92	
50	100		0.6	86	
37.5	100		0.3	67	
20	99		0.15	39	
14	99		0.063	31	



REMARKS
As received moisture content = 12%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

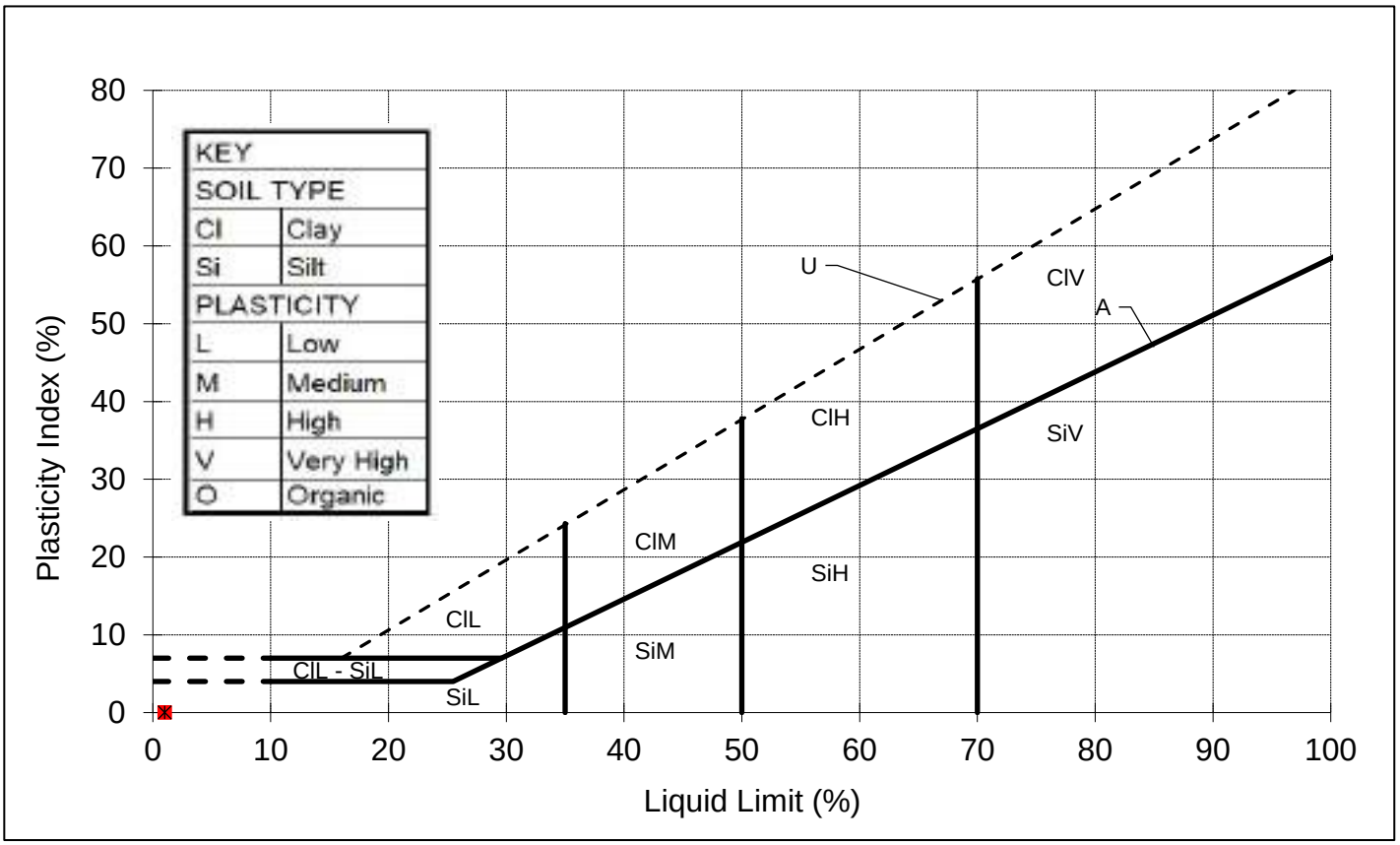
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - E16 - 1.5m	DATE SAMPLED	15-Sep-22
SAMPLE No.	116657	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - 1.5m, E16

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
12	N/A	Non Plastic	N/A	80



REMARKS

Sample tested after wet sieving, Sample did contain some plastic material but due to the amound of fine sand & silt was found to be non plastic,

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

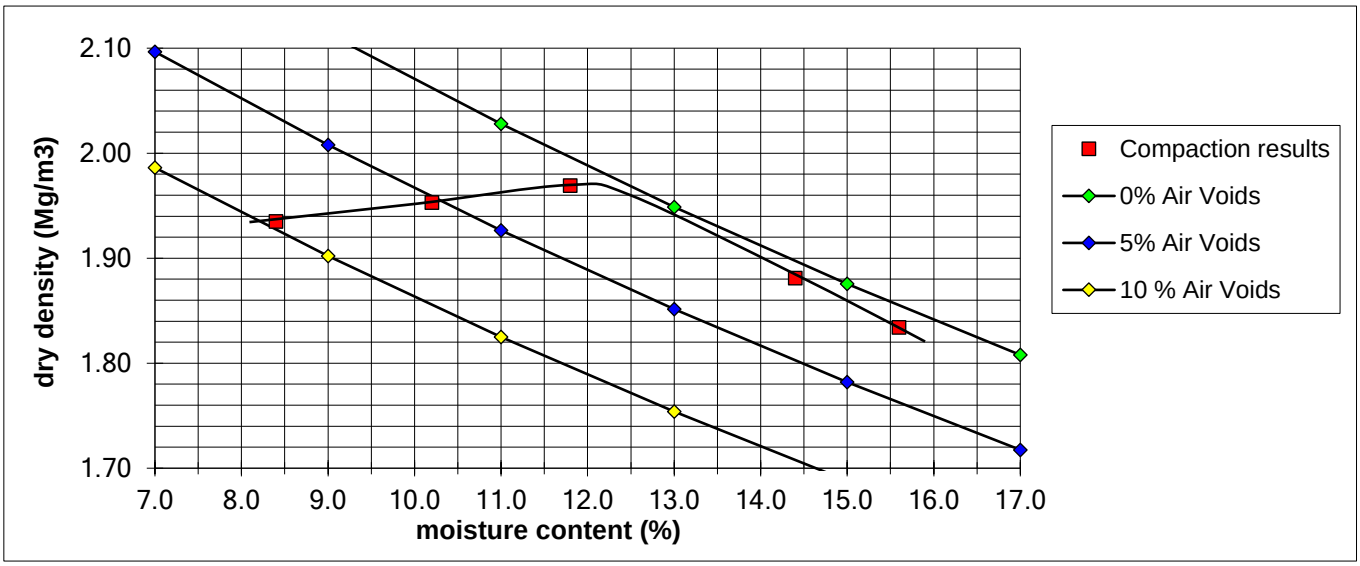
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - E16 - 1.5m	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116657	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - 1.5m, E16
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	8.4	1.935
2	10.2	1.953
3	11.8	1.969
4	14.4	1.881
5	15.6	1.834
Optimum	6.2	
Maximum		1.84
Particle Density	2.61 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 0%
Percentage of material retained on 20mm sieve = 1%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

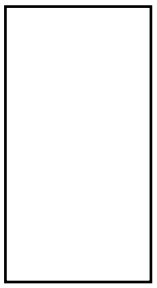
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - E16 - 1.5m	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116657	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - 1.5m, E16

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	97	mm
MOISTURE CONTENT OF SAMPLE	16	%
BULK DENSITY	2.01	Mg/m3
DRY DENSITY	1.73	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.16	103.2	52

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

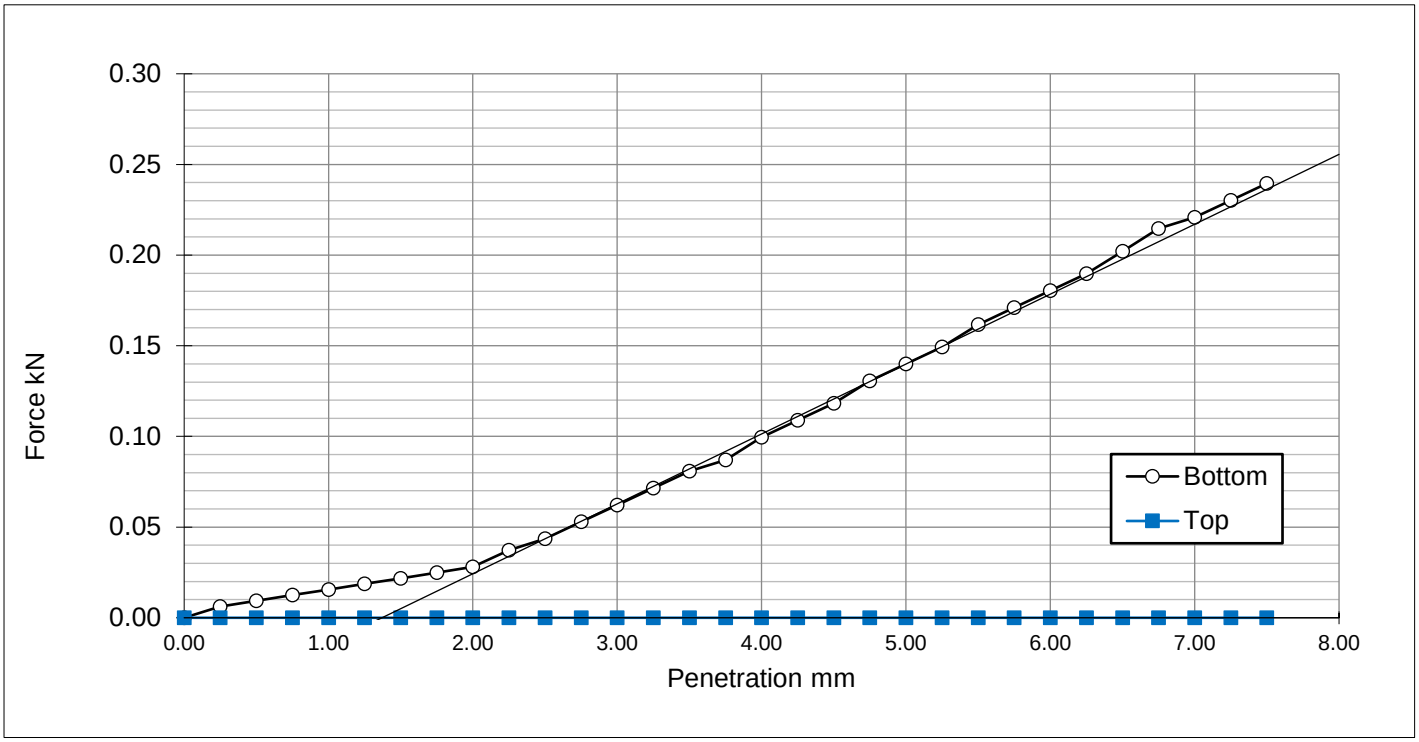
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - E16 - 1.5m	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116657	DATE RECEIVED	15-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - 1.5m, E16

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		1 %			
BULK DENSITY	2.01 Mg/m3	MOISTURE CONTENT	17 %	DRY DENSITY	1.72 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	0.9	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	17	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

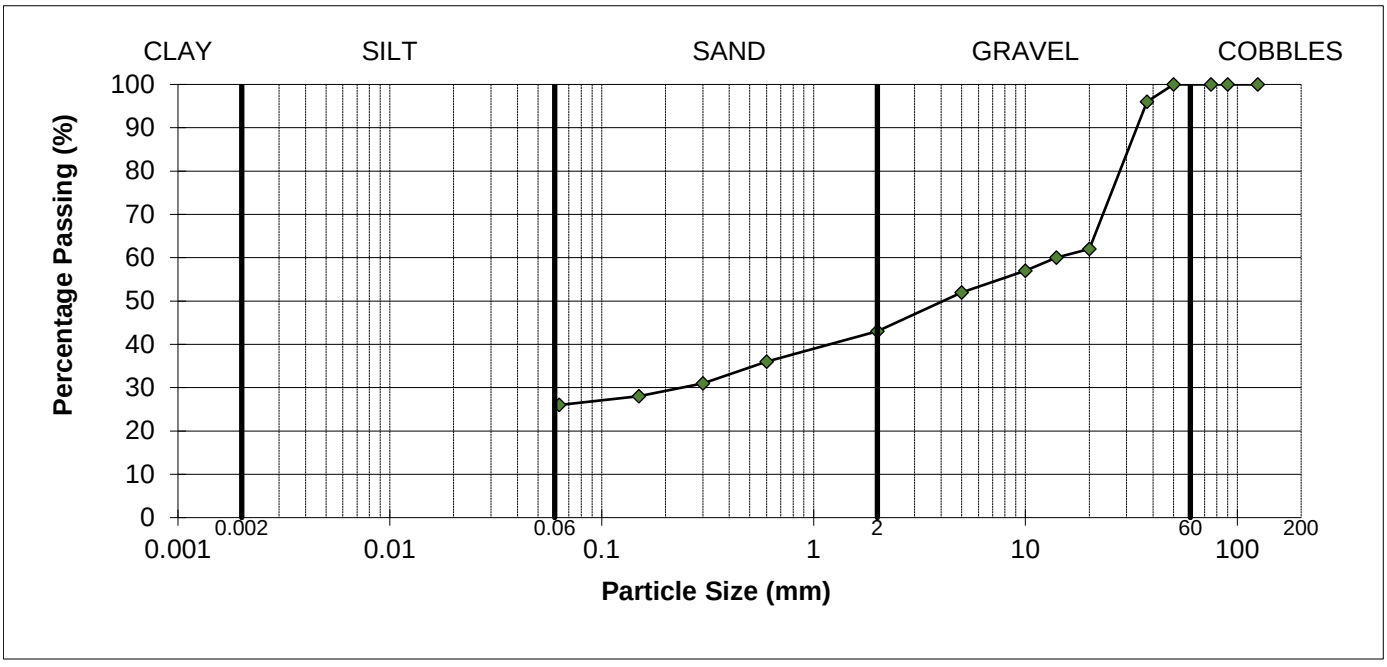
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L4	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116658	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L4, Area 3

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	57	
90	100		5	52	
75	100		2	43	
50	100		0.6	36	
37.5	96		0.3	31	
20	62		0.15	28	
14	60		0.063	26	



REMARKS
As received moisture content = 18%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

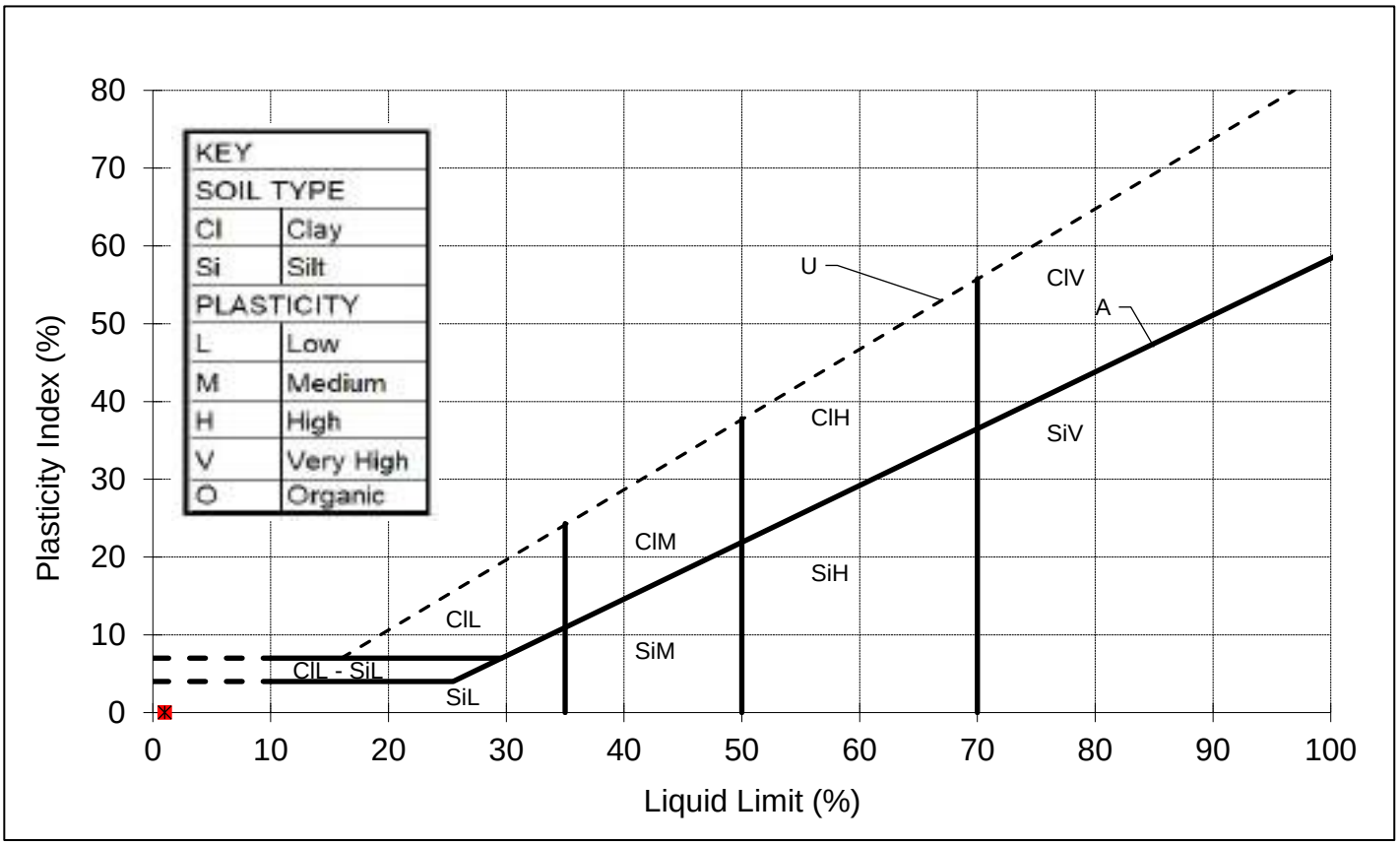
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L4	DATE SAMPLED	15-Sep-22
SAMPLE No.	116658	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L4, Area 3

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18	N/A	Non Plastic	N/A	34



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

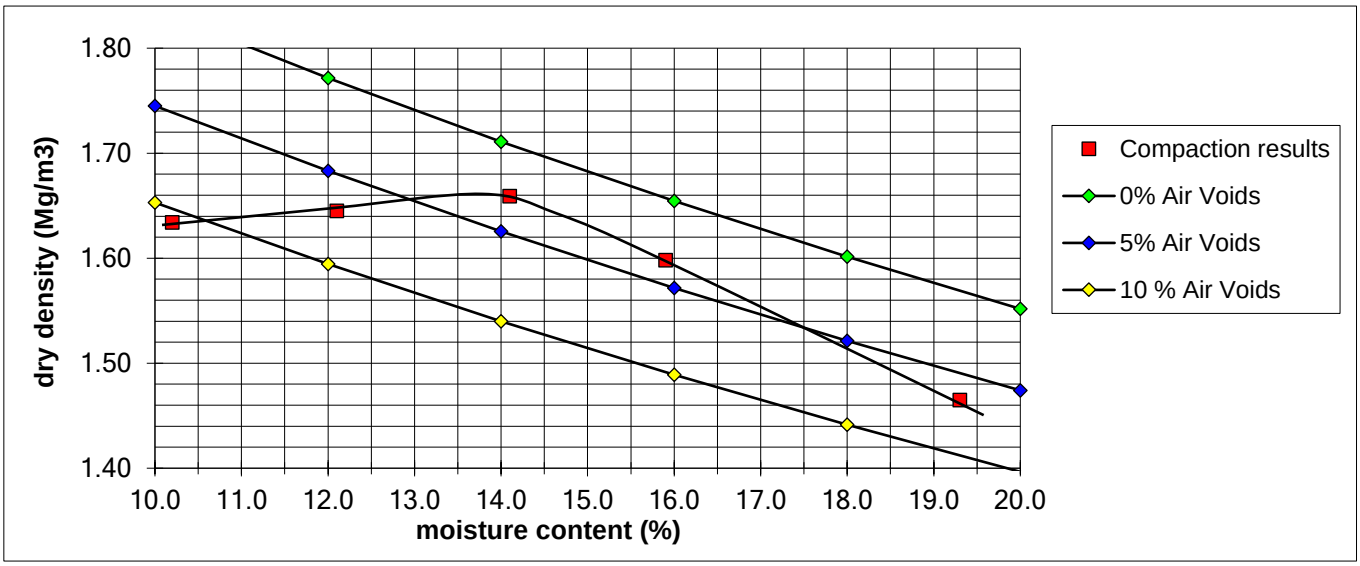
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L4	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116658	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L4, Area 3
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		10.2	1.634
2		12.1	1.645
3		14.1	1.659
4		15.9	1.598
5		19.3	1.465
	Optimum	14.0	
	Maximum		1.66
	Particle Density	2.25 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 4%
Percentage of material retained on 20mm sieve = 38%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

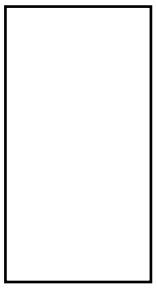
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L4	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116658	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L4, Area 3

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	96	mm
MOISTURE CONTENT OF SAMPLE	21	%
BULK DENSITY	1.70	Mg/m3
DRY DENSITY	1.40	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.16	157.9	79

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

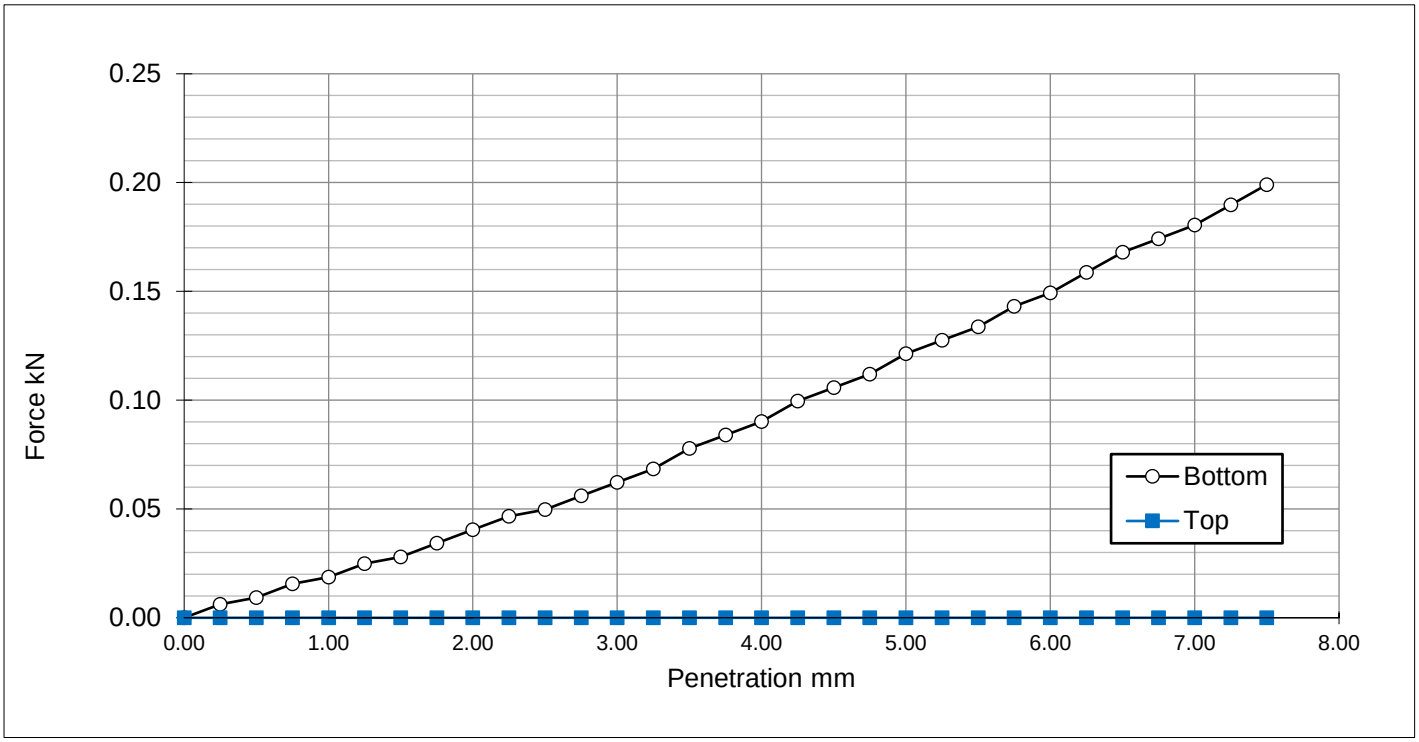
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L4	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116658	DATE RECEIVED	15-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L4, Area 3

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		38 %			
BULK DENSITY	1.70 Mg/m3	MOISTURE CONTENT	21 %	DRY DENSITY	1.40 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	0.6	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	21	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

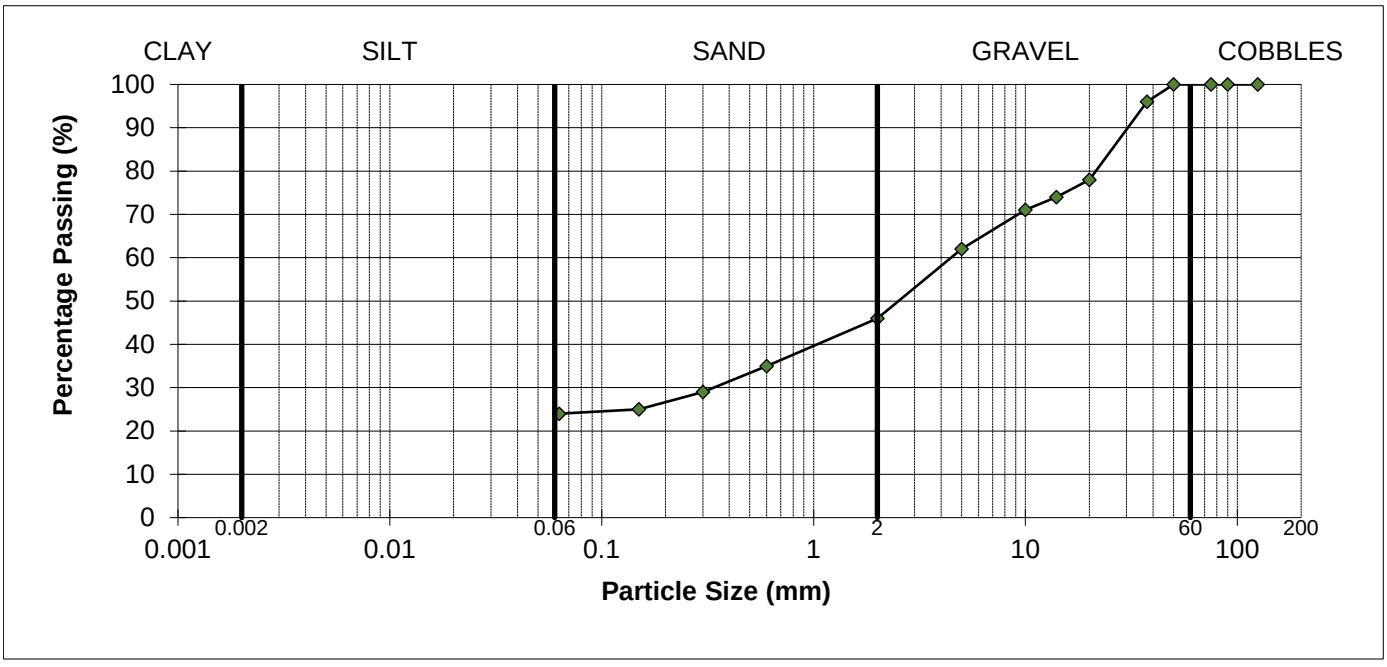
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L5	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116659	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L5, Area 3

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	71	
90	100		5	62	
75	100		2	46	
50	100		0.6	35	
37.5	96		0.3	29	
20	78		0.15	25	
14	74		0.063	24	



REMARKS
As received moisture content = 9.8%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

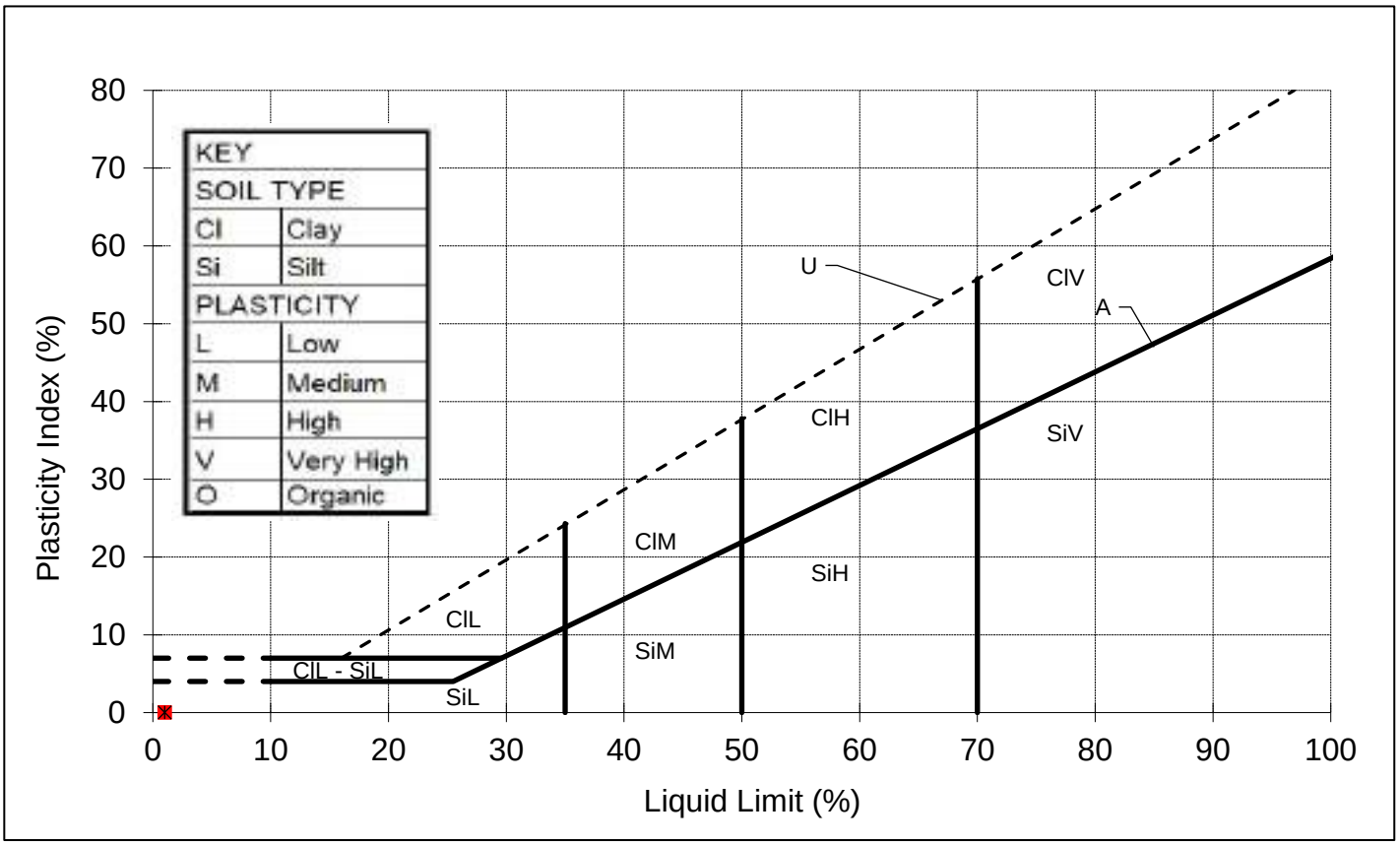
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L5	DATE SAMPLED	15-Sep-22
SAMPLE No.	116659	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L5, Area 3

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
9.8	N/A	Non Plastic	N/A	33



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

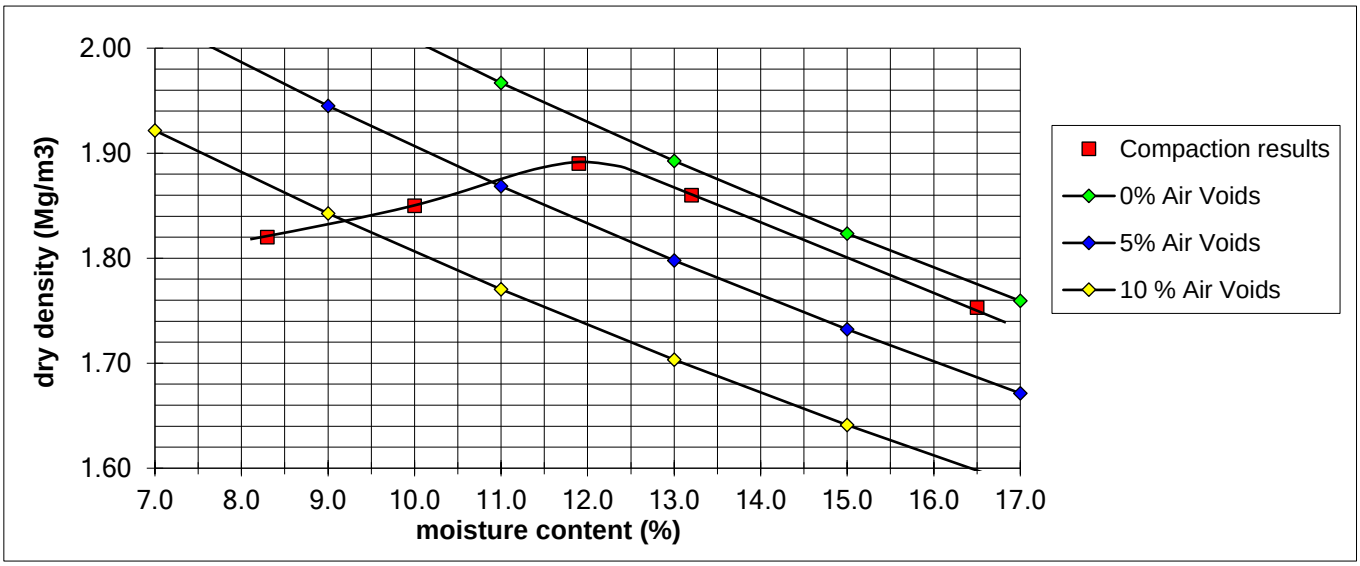
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L5	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116659	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L5, Area 3
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	8.3	1.820
2	10.0	1.850
3	11.9	1.890
4	13.2	1.860
5	16.5	1.753
Optimum	12.0	
Maximum		1.89
Particle Density	2.51 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 4%
Percentage of material retained on 20mm sieve = 22%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

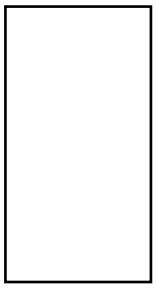
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L5	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116659	DATE RECEIVED	15-Sep-22
DATE TESTED	21-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L5, Area 3

SPECIMEN LENGTH	201	mm
SPECIMEN DIAMETER	99	mm
MOISTURE CONTENT OF SAMPLE	13	%
BULK DENSITY	2.02	Mg/m3
DRY DENSITY	1.78	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.11	707.0	354

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

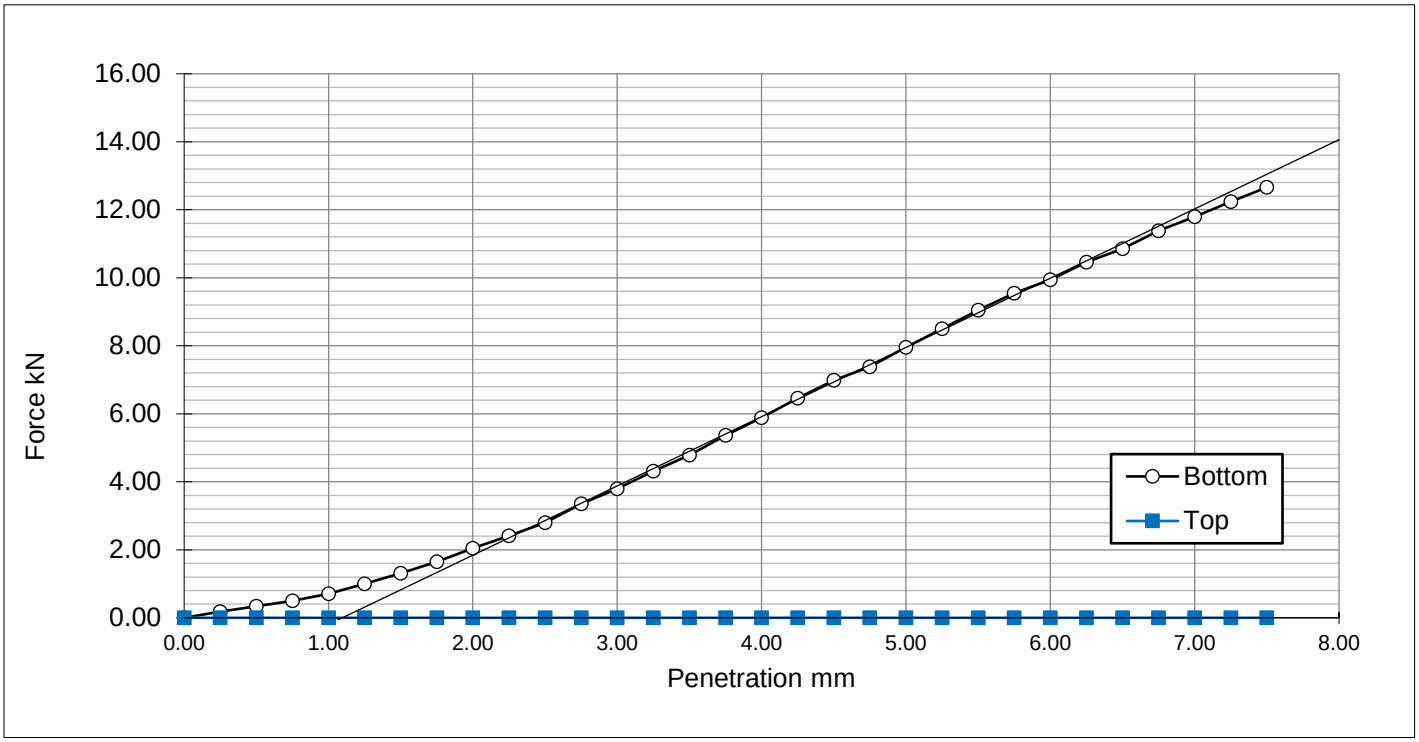
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/74

SAMPLE LABEL	Preclass - Area 3 - L5	DATE SAMPLED	15-Sep-22
LAB SAMPLE No	116659	DATE RECEIVED	15-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L5, Area 3

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		22 %			
BULK DENSITY	2.02 Mg/m3	MOISTURE CONTENT	13 %	DRY DENSITY	1.78 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	49.7	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	13	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/75
Date of Issue 13 October 2022
Page 1 of 16

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

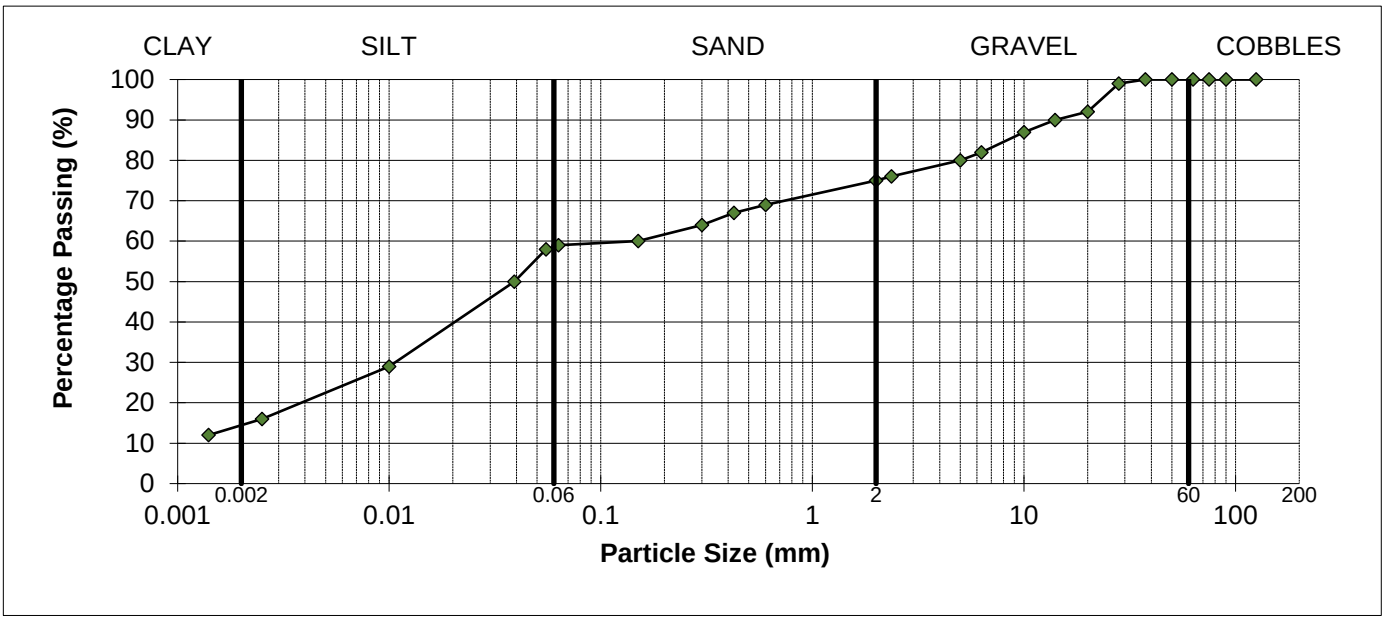
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	Top Soil & Brown Clay
ADVISED SOURCE	Site Won - 0+m

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	76	
90	100		2	75	
75	100		0.6	69	
63	100		0.425	67	
50	100		0.3	64	
37.5	100		0.15	60	
28	99		0.063	59	
20	92		0.055	58	
14	90		0.039	50	
10	87		0.01	29	
6.3	82		0.0025	16	
5	80		0.0014	12	



REMARKS
As received moisture content = 22%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

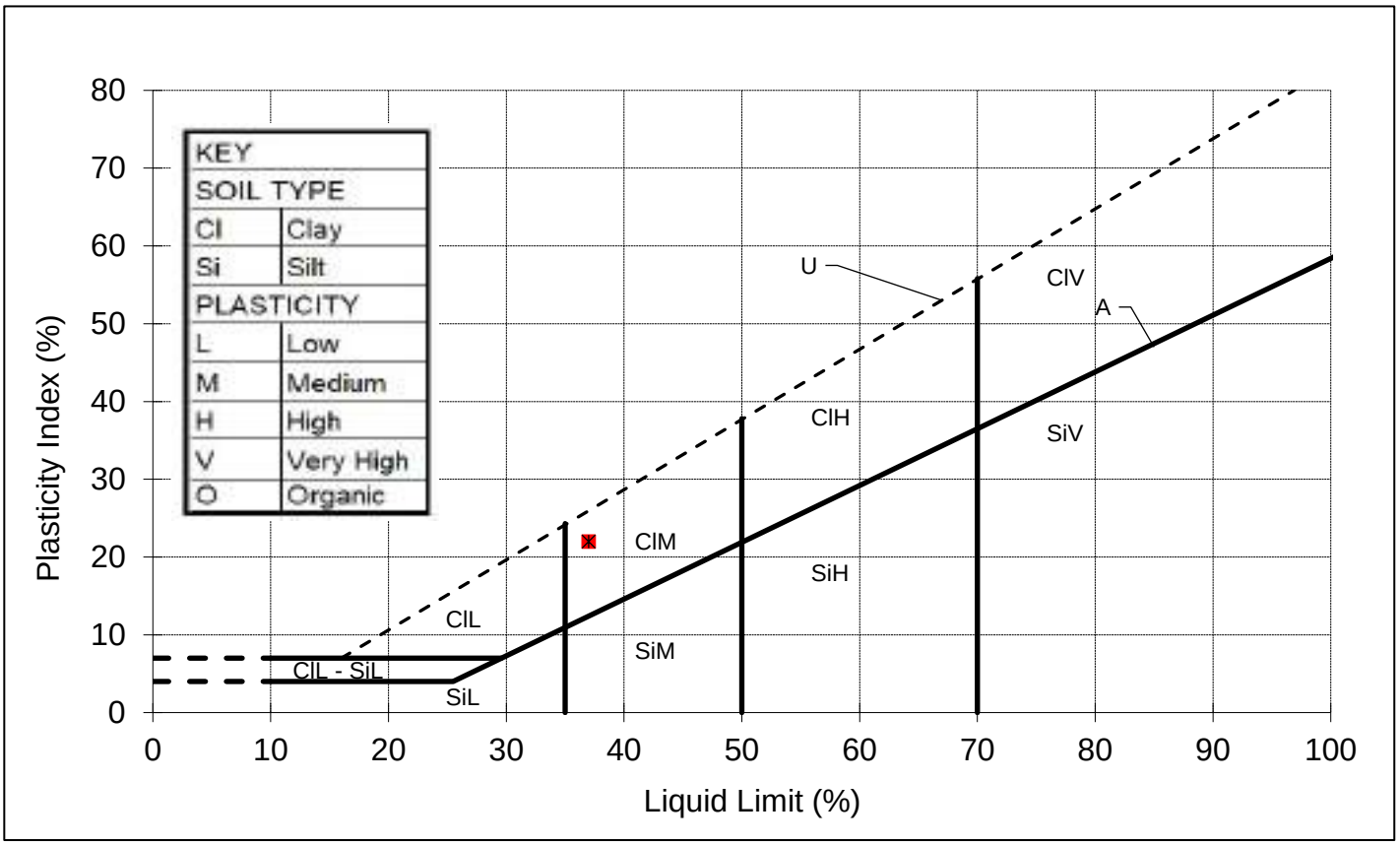
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
SAMPLE No.	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	Top Soil & Brown Clay
ADVISED SOURCE	Site Won - 0+m

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22	37	15	22	67



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

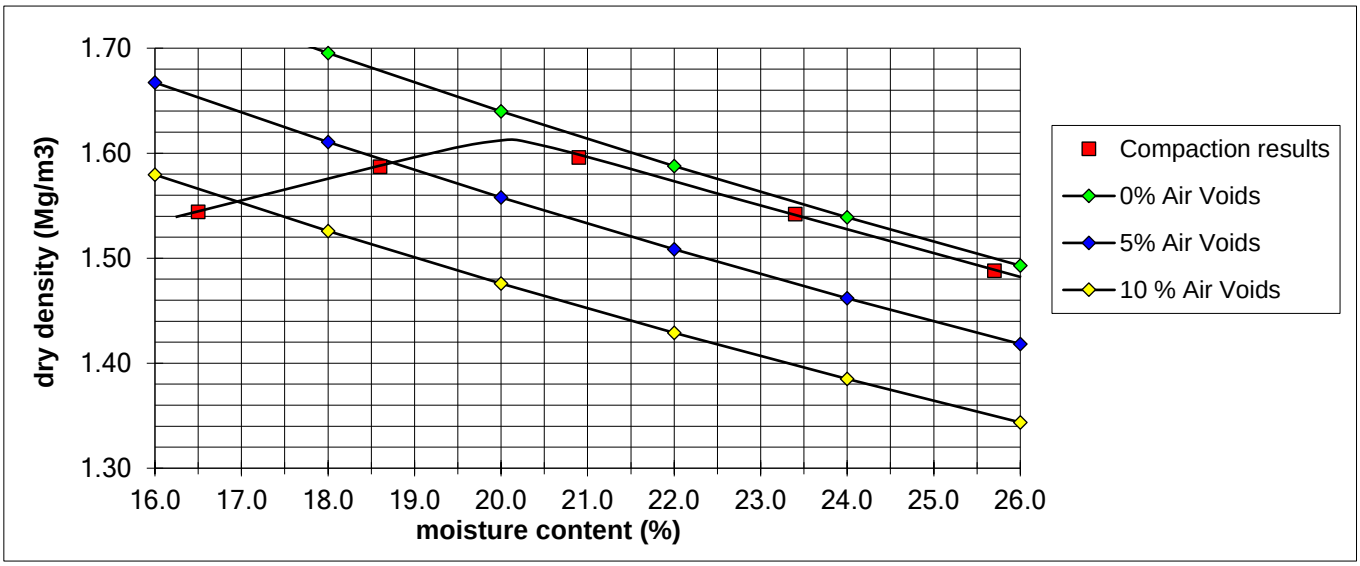
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	Top Soil & Brown Clay
ADVISED SOURCE	Site Won - 0+m
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		16.5	1.544
2		18.6	1.587
3		20.9	1.596
4		23.4	1.542
5		25.7	1.488
	Optimum	20.0	
	Maximum		1.61
	Particle Density	2.44 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 0%
Percentage of material retained on 20mm sieve = 8%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

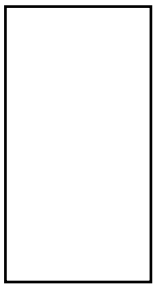
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	Top Soil & Brown Clay
ADVISED SOURCE	Site Won - 0+m

SPECIMEN LENGTH	196	mm
SPECIMEN DIAMETER	98	mm
MOISTURE CONTENT OF SAMPLE	29	%
BULK DENSITY	1.74	Mg/m3
DRY DENSITY	1.35	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.36	24.9	12

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

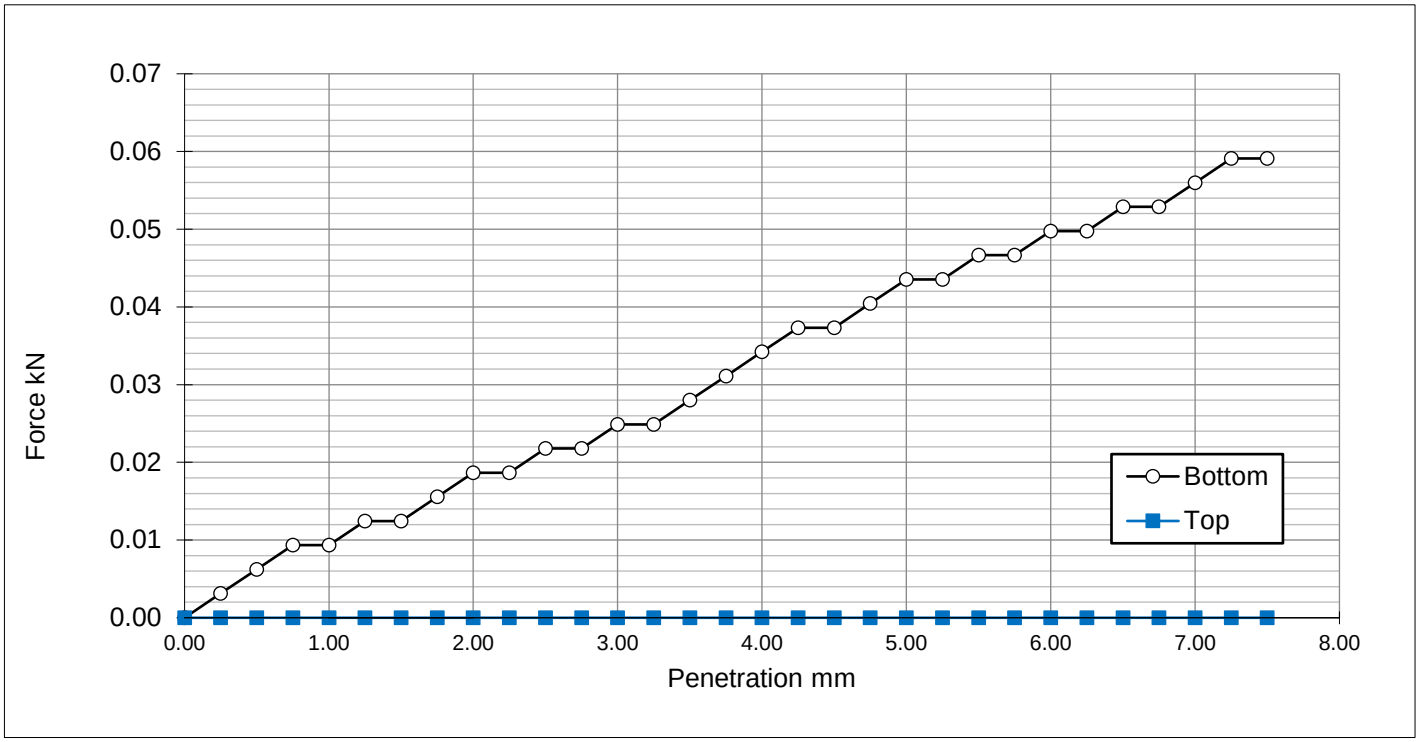
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	Top Soil & Brown Clay
ADVISED SOURCE	Site Won - 0+m

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		8 %			
BULK DENSITY	1.74 Mg/m3	MOISTURE CONTENT	29 %	DRY DENSITY	1.35 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	0.2	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	29	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

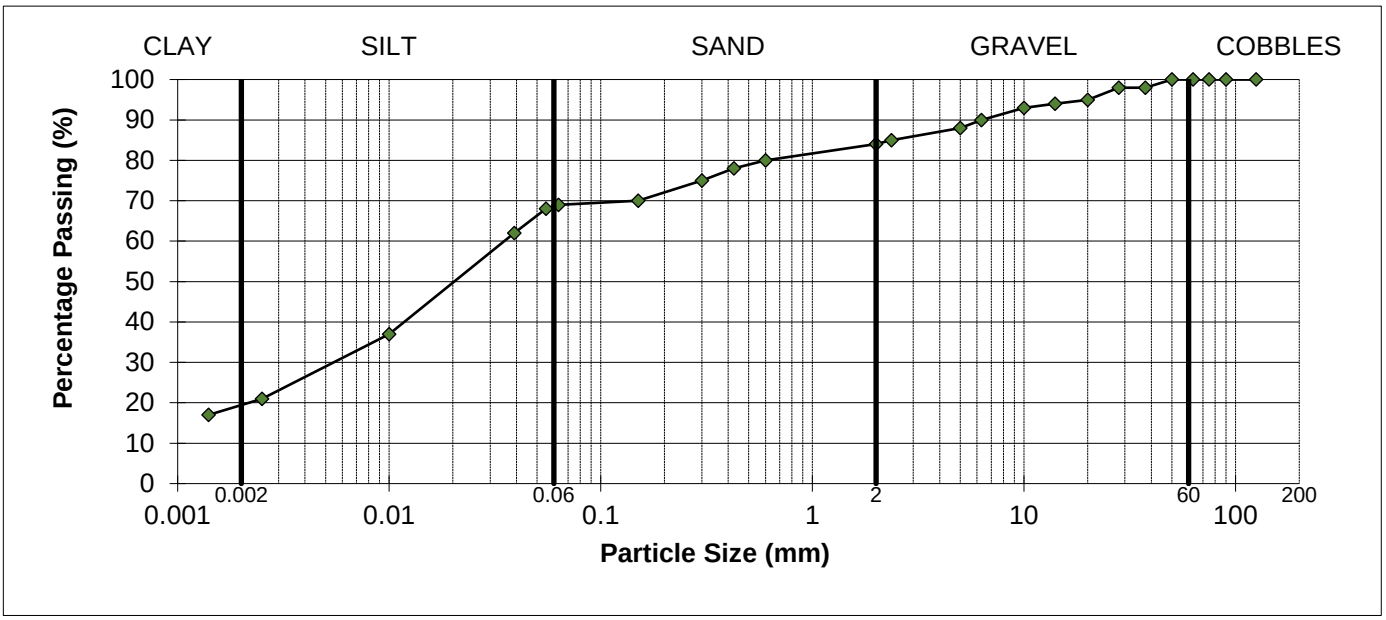
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	85	
90	100		2	84	
75	100		0.6	80	
63	100		0.425	78	
50	100		0.3	75	
37.5	98		0.15	70	
28	98		0.063	69	
20	95		0.055	68	
14	94		0.039	62	
10	93		0.01	37	
6.3	90		0.0025	21	
5	88		0.0014	17	



REMARKS
As received moisture content = 16%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

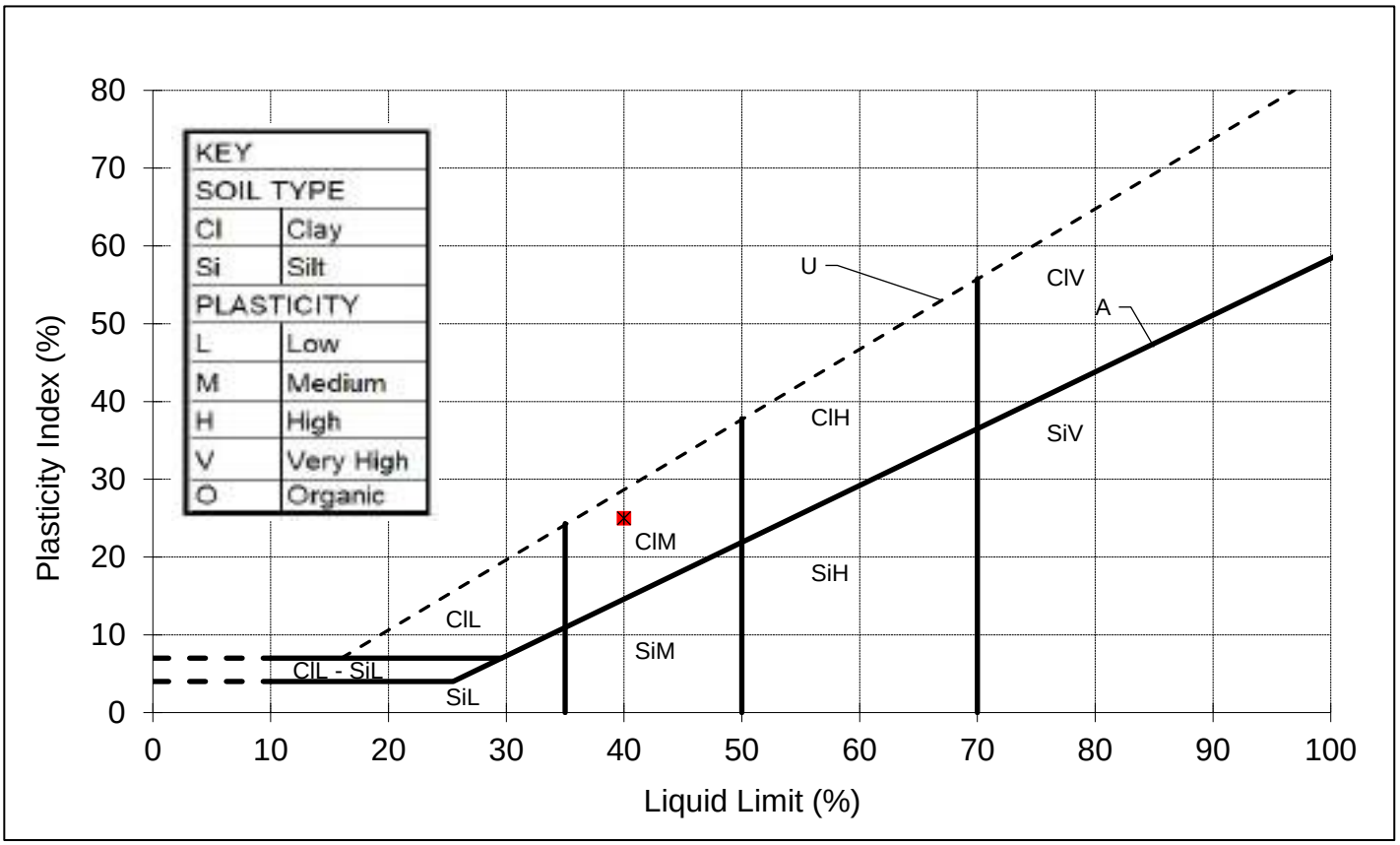
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
SAMPLE No.	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
16	40	15	25	78



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

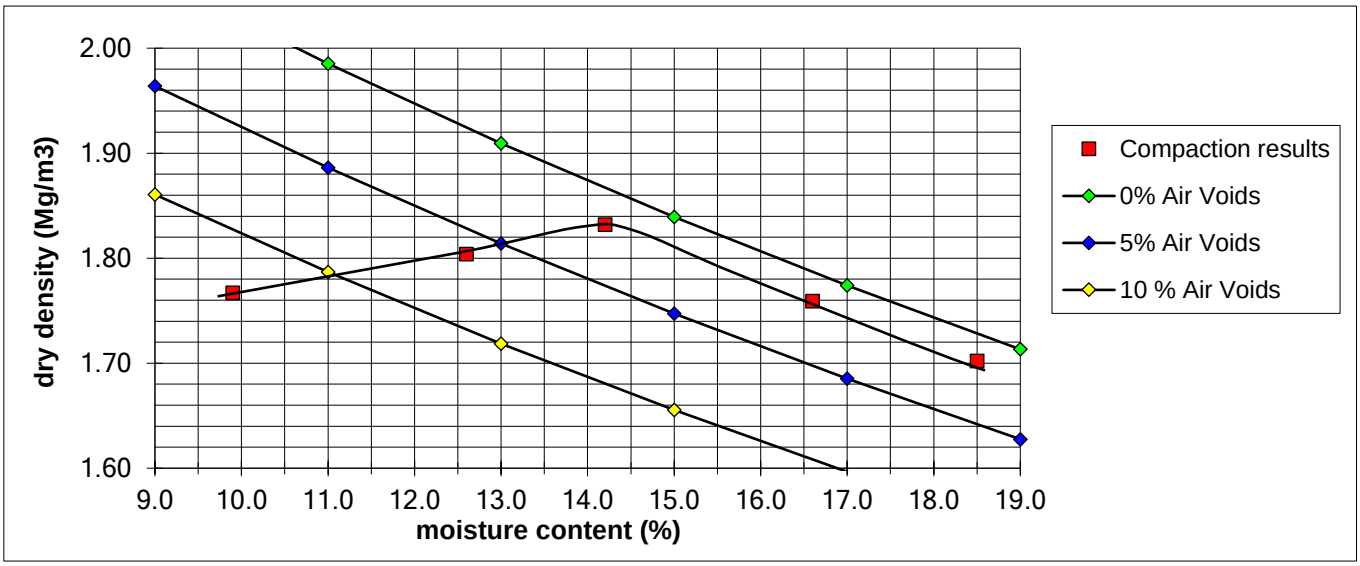
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		9.9	1.767
2		12.6	1.804
3		14.2	1.832
4		16.6	1.759
5		18.5	1.702
	Optimum	14.0	
	Maximum		1.83
	Particle Density	2.54 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 2%
Percentage of material retained on 20mm sieve = 5%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

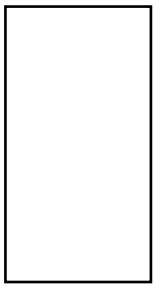
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	98	mm
MOISTURE CONTENT OF SAMPLE	23	%
BULK DENSITY	1.99	Mg/m3
DRY DENSITY	1.61	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.37	77.93	39

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

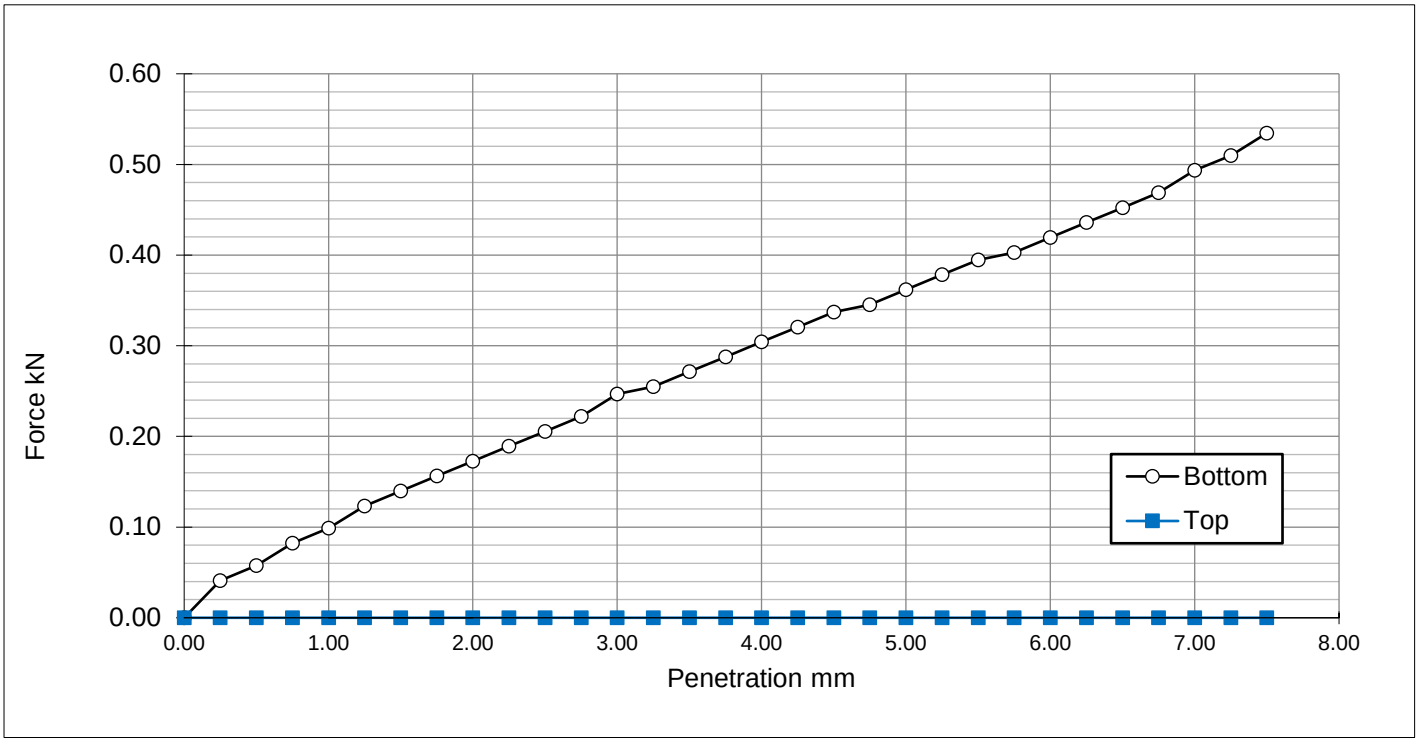
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		5 %			
BULK DENSITY	1.99 Mg/m3	MOISTURE CONTENT	23 %	DRY DENSITY	1.61 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	1.8	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	23	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

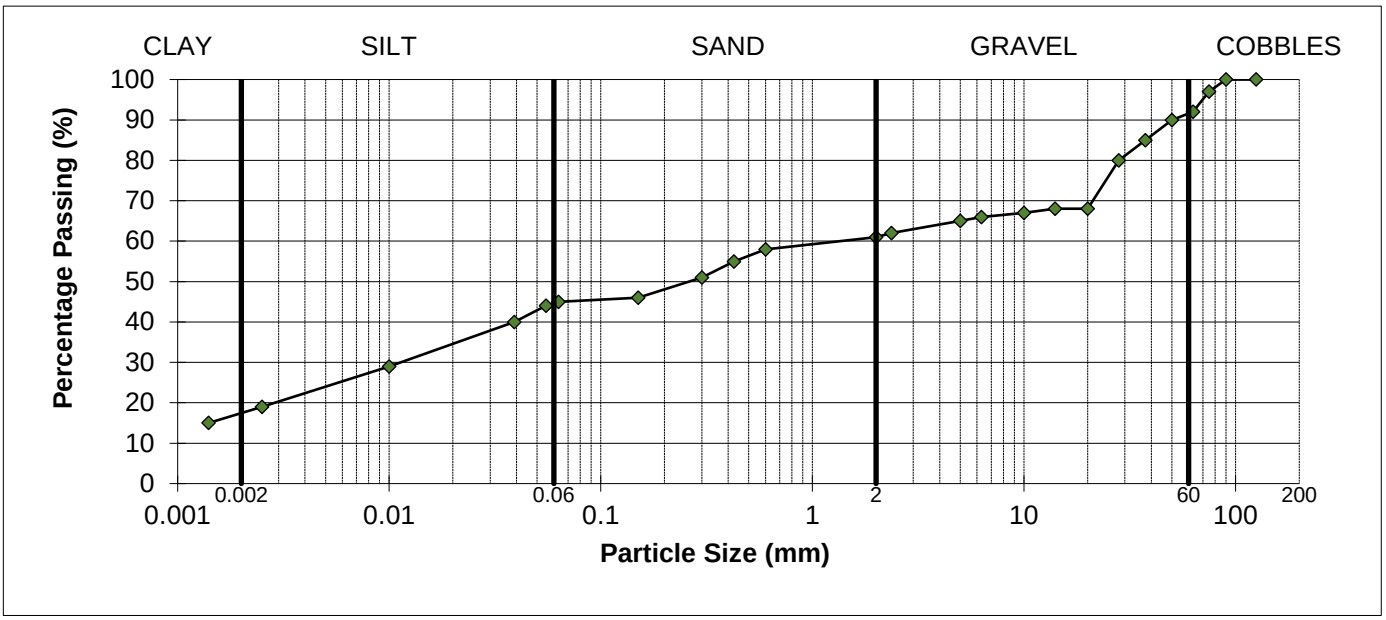
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Clay
ADVISED SOURCE	Site Won - 1.5m

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	62	
90	100		2	61	
75	97		0.6	58	
63	92		0.425	55	
50	90		0.3	51	
37.5	85		0.15	46	
28	80		0.063	45	
20	68		0.055	44	
14	68		0.039	40	
10	67		0.01	29	
6.3	66		0.0025	19	
5	65		0.0014	15	



REMARKS
As received moisture content = 13%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

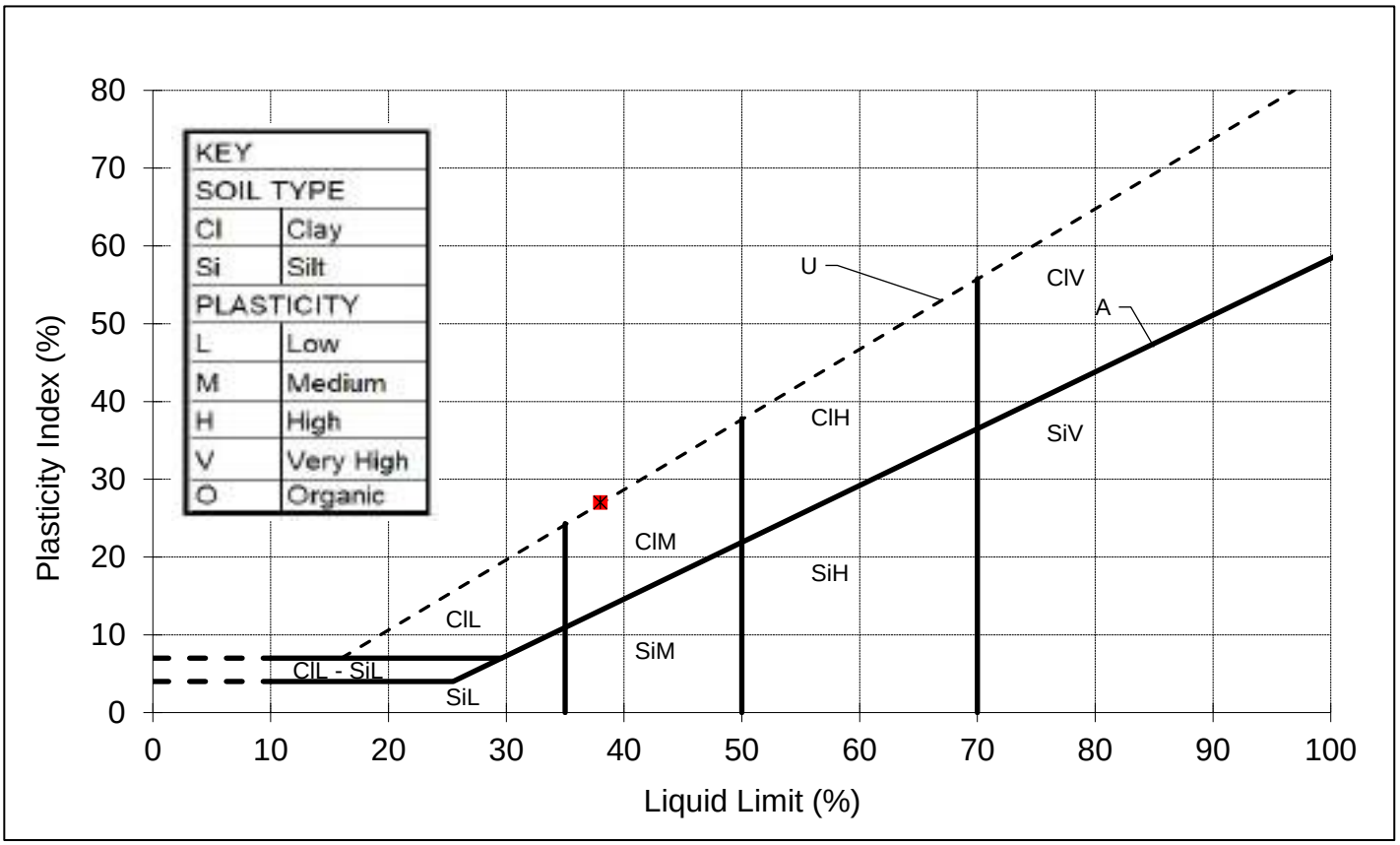
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
SAMPLE No.	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Clay
ADVISED SOURCE	Site Won - 1.5m

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
13	38	11	27	55



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

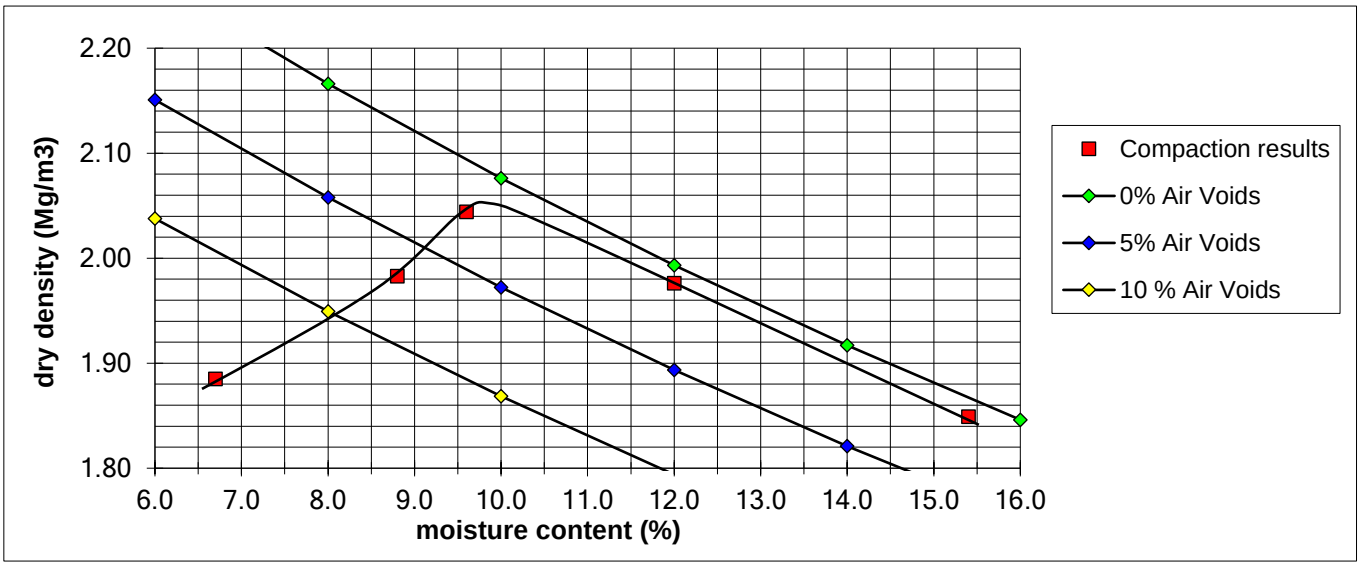
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Clay
ADVISED SOURCE	Site Won - 1.5m
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	6.7	1.885
2	8.8	1.983
3	9.6	2.044
4	12.0	1.976
5	15.4	1.849
Optimum	9.8	
Maximum		2.05
Particle Density	2.62 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 15%
Percentage of material retained on 20mm sieve = 32%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

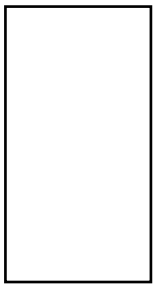
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116623	DATE RECEIVED	13-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	NG - Orange Clay
ADVISED SOURCE	Site Won - 1.5m

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	99	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.14	Mg/m3
DRY DENSITY	1.86	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.37	249.5	125

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

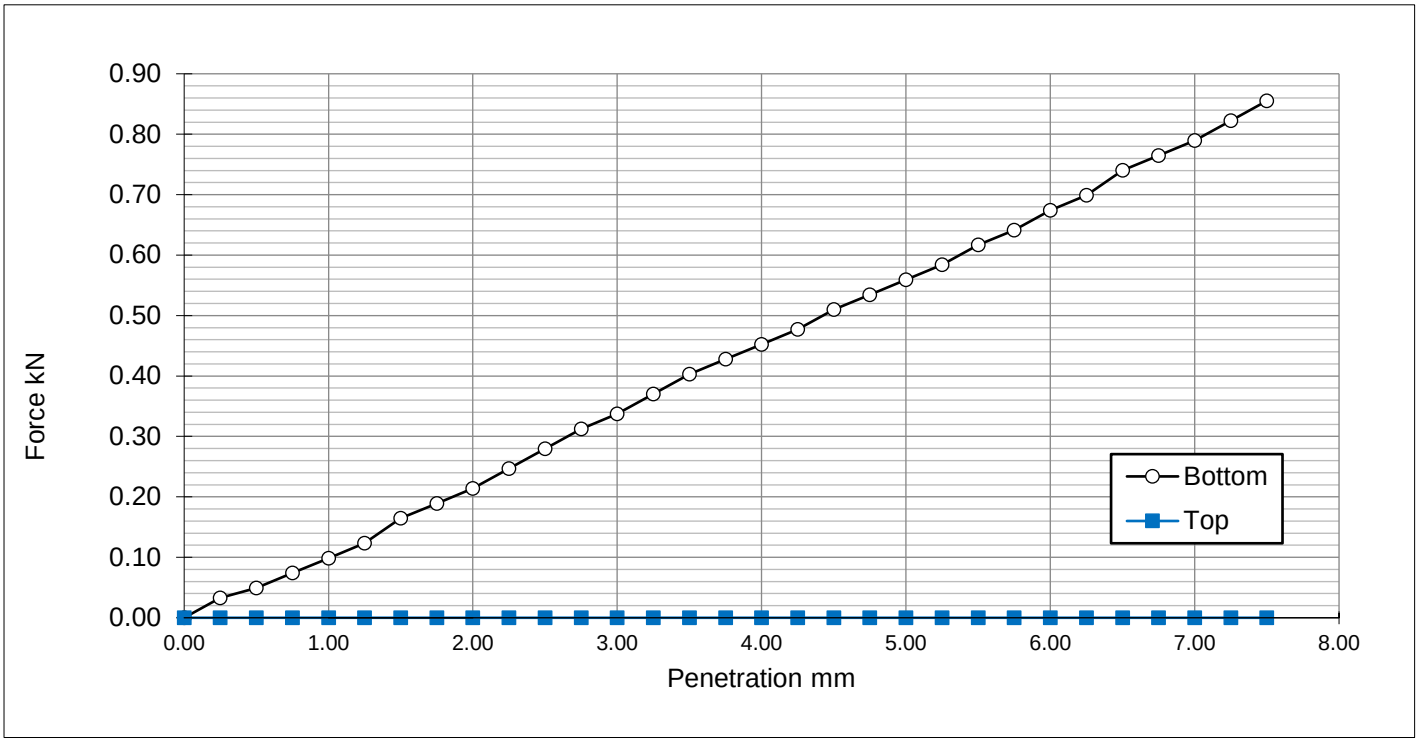
CLIENT	VHE Construction Plc
SITE	Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/75

SAMPLE LABEL	Trial Pit F4	DATE SAMPLED	13-Sep-22
LAB SAMPLE No	116622	DATE RECEIVED	13-Sep-22
DATE TESTED	03-Oct-22	SAMPLED BY	Client

MATERIAL	NG - Orange Mottled Clay
ADVISED SOURCE	Site Won - 0m

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 2.5 kg Rammer			
GREATER THAN 20 mm REMOVED		32 %			
BULK DENSITY	2.14 Mg/m3	MOISTURE CONTENT	15 %	DRY DENSITY	1.86 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	2.8	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	15	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/76
Date of Issue 13 October 2022
Page 1 of 13

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

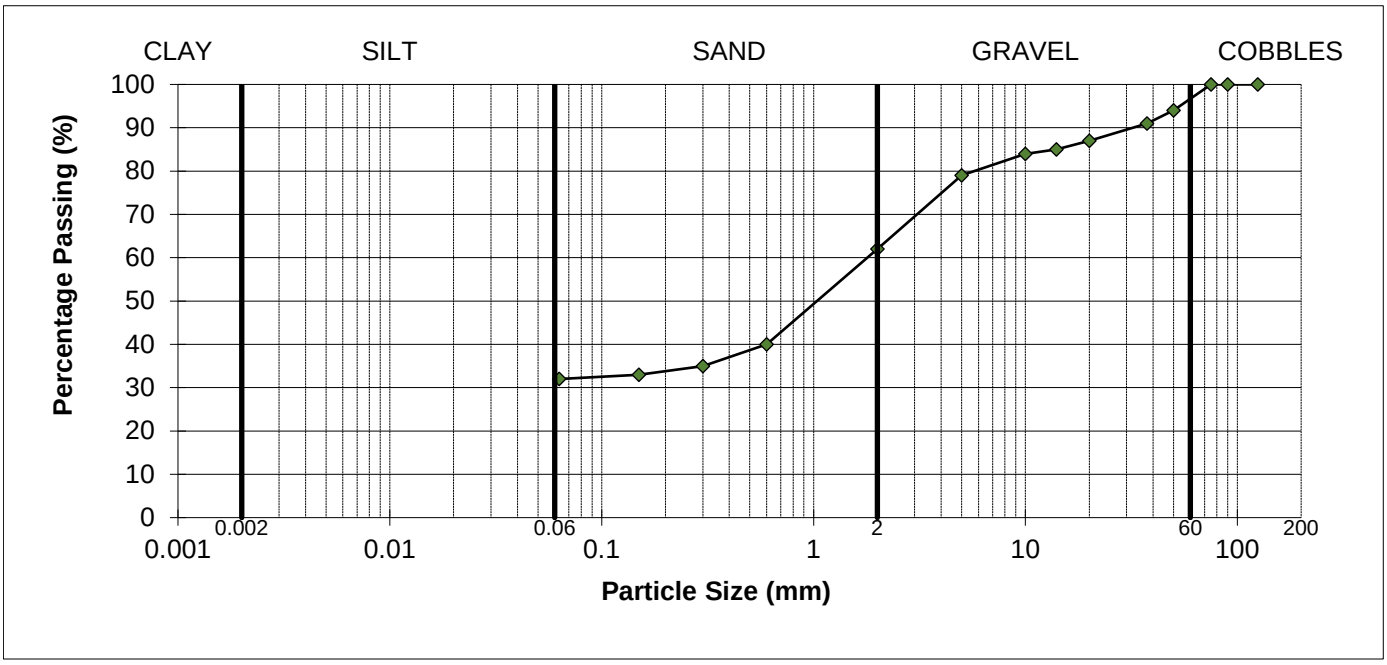
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass- A20- SP-Black Fines	DATE SAMPLED	20-Sep-22
LAB SAMPLE No	116900	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP A20

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	84	
90	100		5	79	
75	100		2	62	
50	94		0.6	40	
37.5	91		0.3	35	
20	87		0.15	33	
14	85		0.063	32	



REMARKS
As received moisture content = 11%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

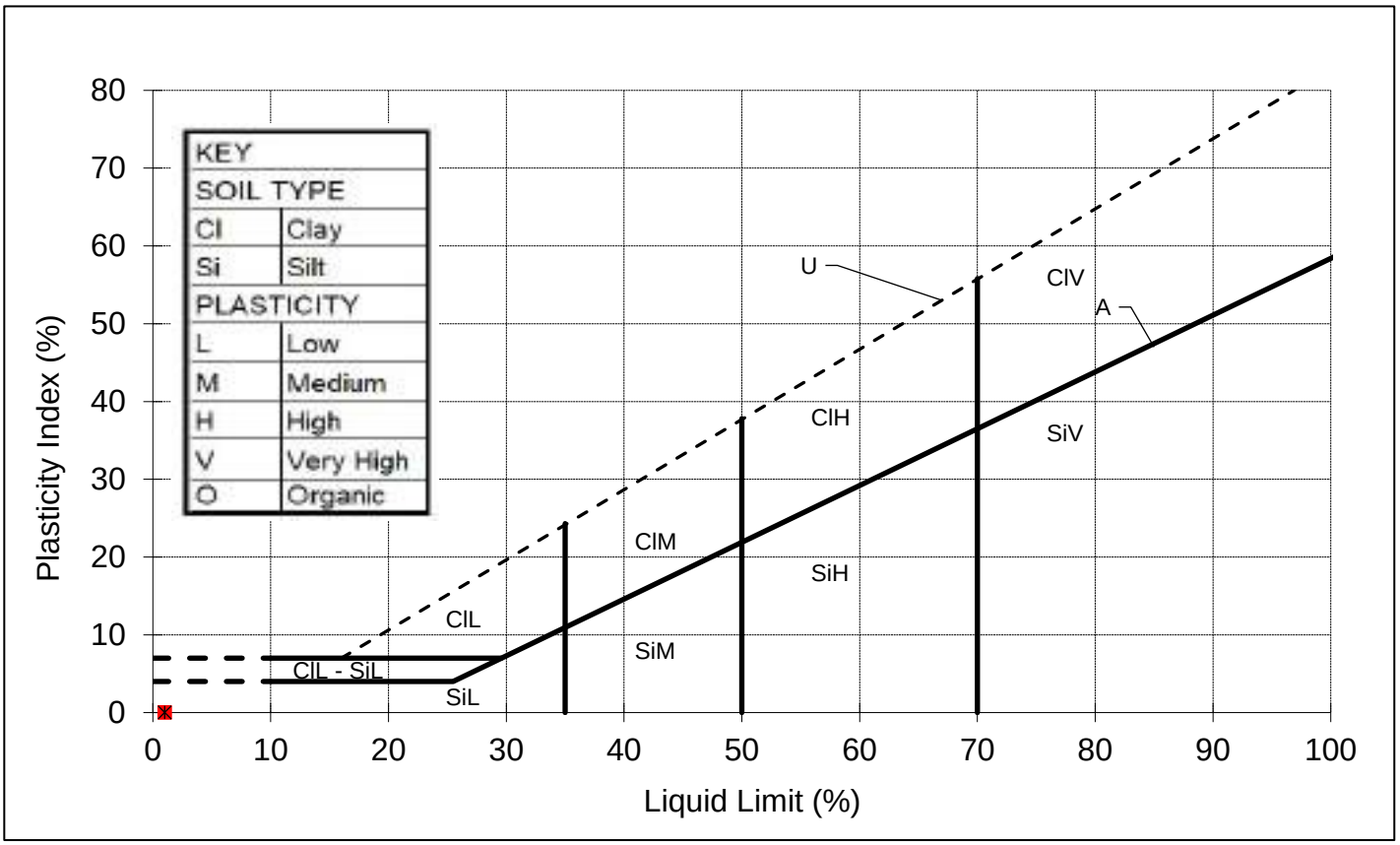
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass- A20- SP-Black Fines	DATE SAMPLED	20-Sep-22
SAMPLE No.	116900	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP A20

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
11	N/A	Non Plastic	N/A	37



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

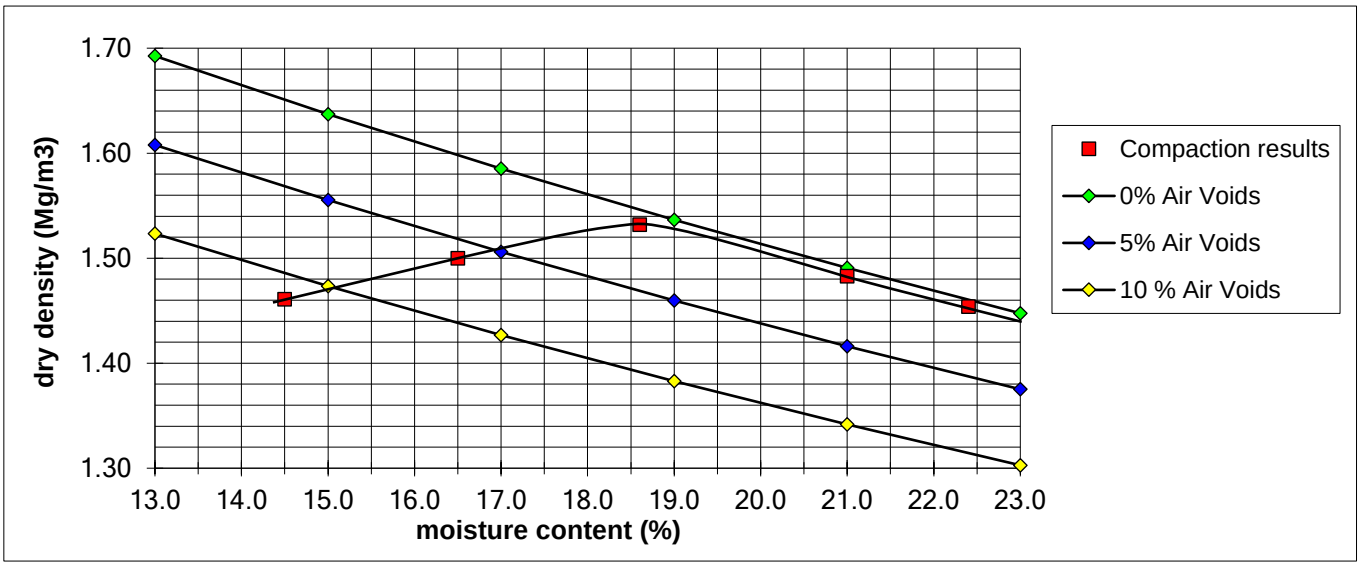
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass- A20- SP-Black Fin	DATE SAMPLED	20-Sep-22
LAB SAMPLE No	116900	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP A20
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	14.5	1.461
2	16.5	1.500
3	18.6	1.532
4	21.0	1.483
5	22.4	1.454
Optimum	19.0	
Maximum		1.53
Particle Density	2.17 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 9%
Percentage of material retained on 20mm sieve = 13%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

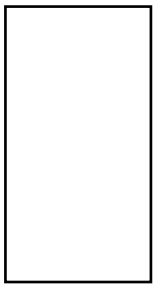
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass- A20- SP-Black Fines	DATE SAMPLED	20-Sep-22
LAB SAMPLE No	116900	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP A20

SPECIMEN LENGTH	203	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	22	%
BULK DENSITY	1.70	Mg/m3
DRY DENSITY	1.40	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	8	0.82	824.5	412

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

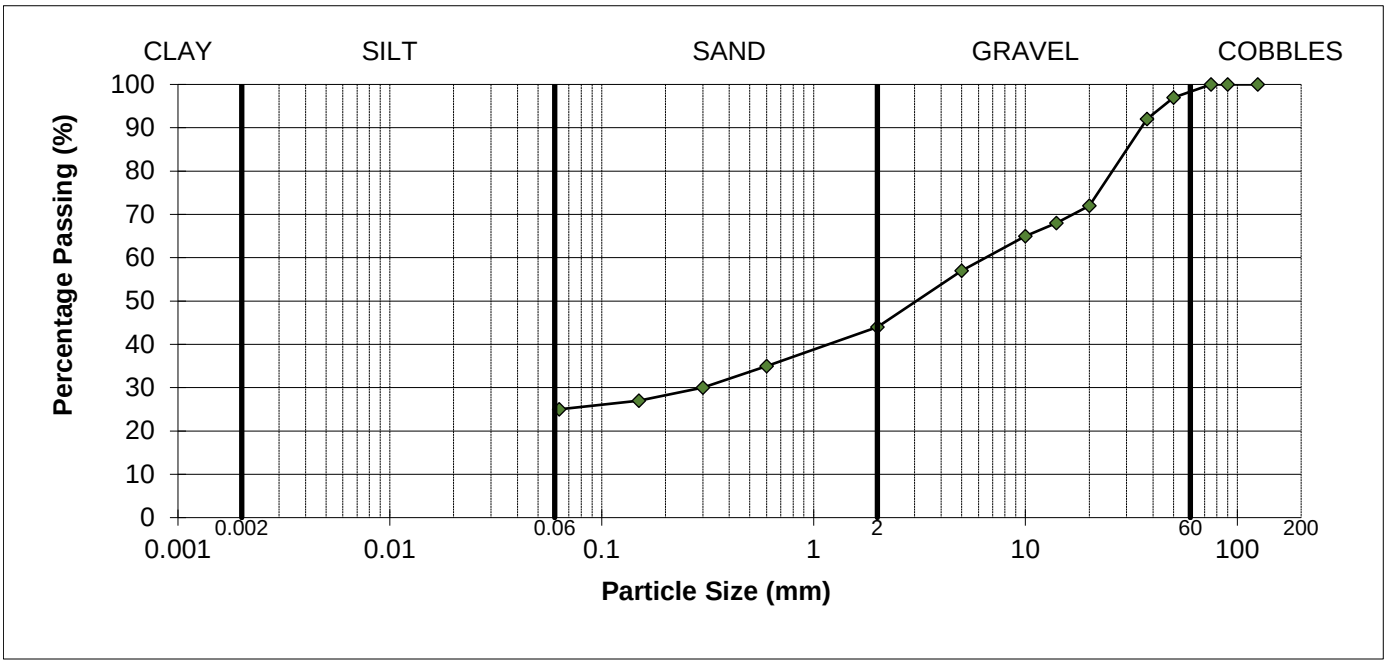
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-Area 3-L6-B15	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116901	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L6 B15

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	65	
90	100		5	57	
75	100		2	44	
50	97		0.6	35	
37.5	92		0.3	30	
20	72		0.15	27	
14	68		0.063	25	



REMARKS
As received moisture content = 5.8%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

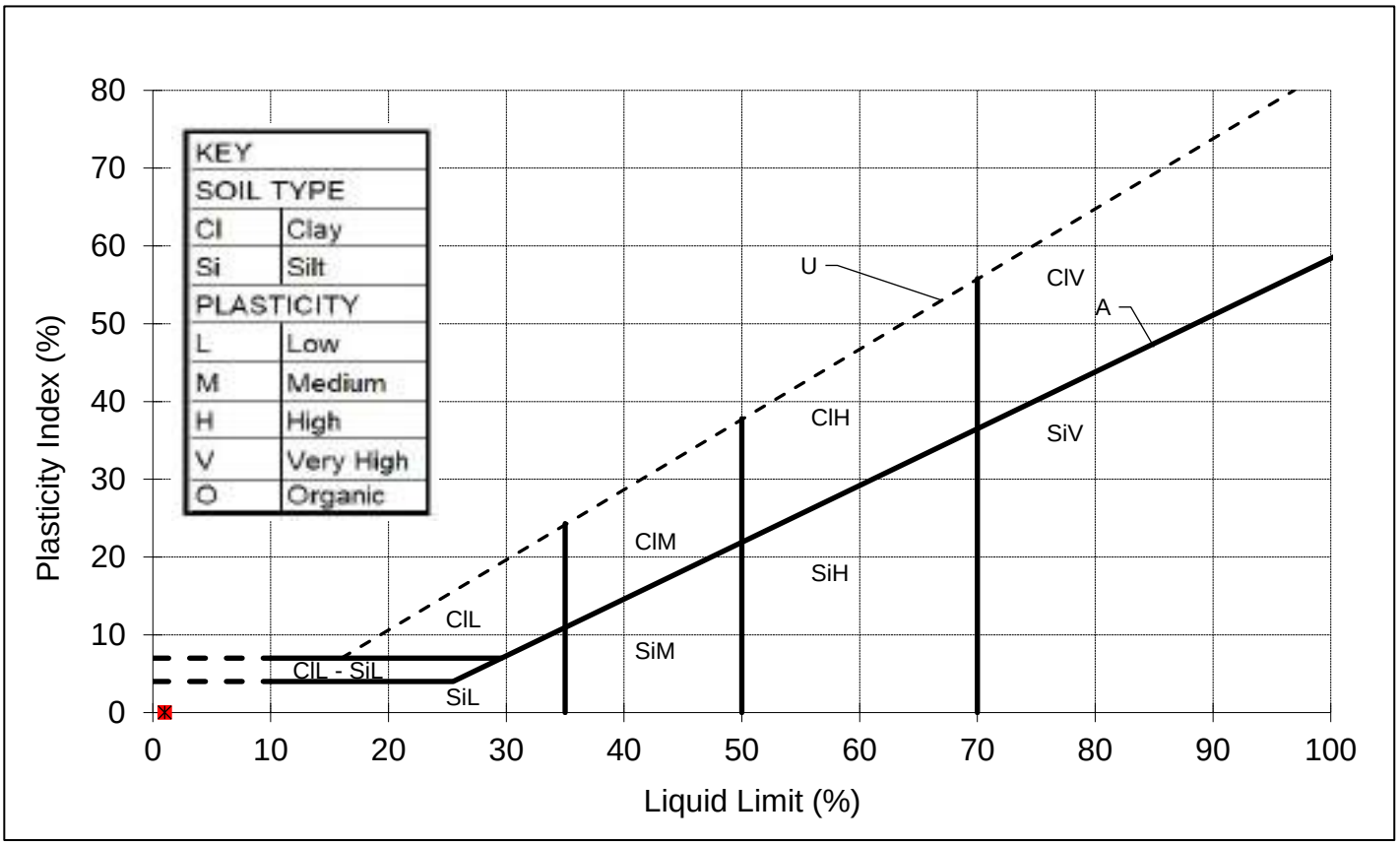
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-Area 3-L6-B15	DATE SAMPLED	22-Sep-22
SAMPLE No.	116901	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L6 B15

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
5.8	N/A	Non Plastic	N/A	33



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

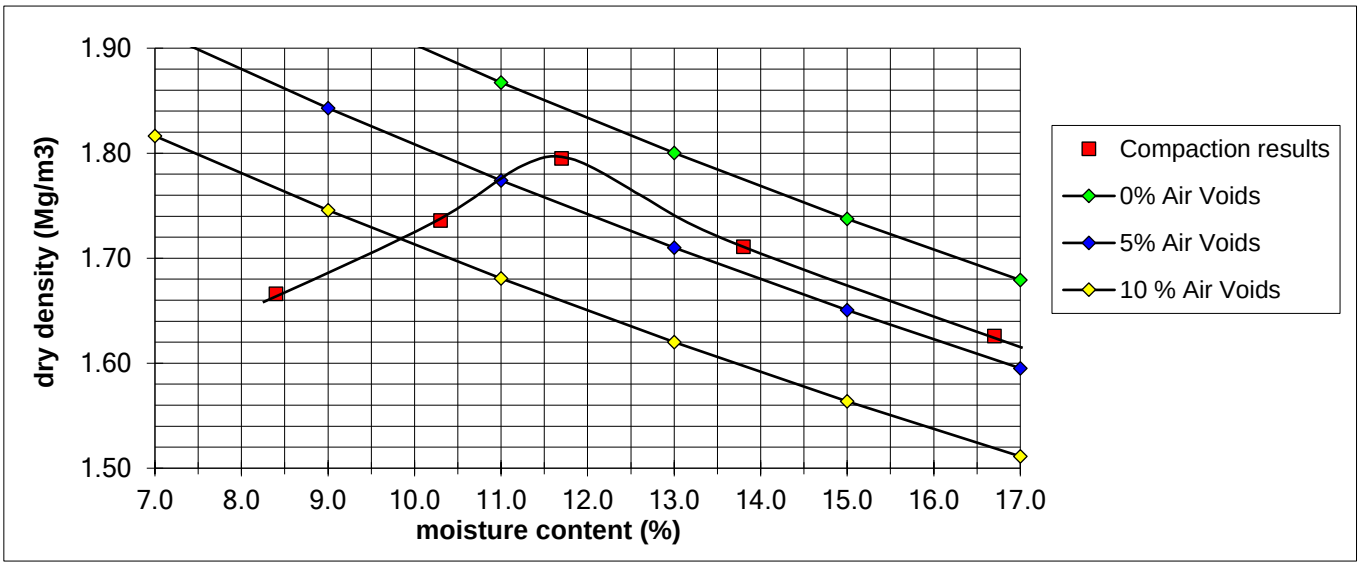
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-Area 3-L6-B15	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116901	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L6 B15
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		8.4	1.666
2		10.3	1.736
3		11.7	1.795
4		13.8	1.711
5		16.7	1.626
	Optimum	12.0	
	Maximum		1.79
	Particle Density	2.35 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 8%
Percentage of material retained on 20mm sieve = 28%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

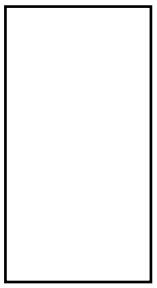
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-Area 3-L6-B15	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116901	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L6 B15

SPECIMEN LENGTH	203	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	12	%
BULK DENSITY	1.98	Mg/m3
DRY DENSITY	1.76	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	5	0.84	778.4	389

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

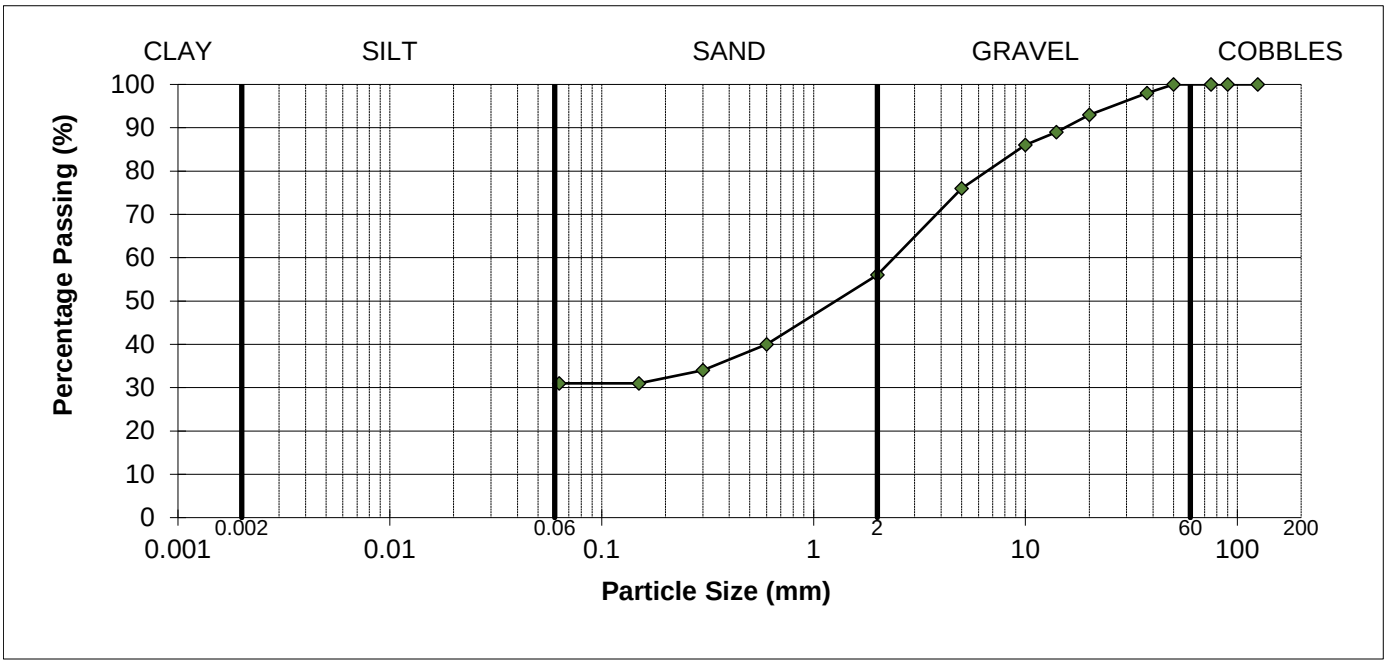
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-B15-L7-Black Fines	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116902	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L7 B15

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	86	
90	100		5	76	
75	100		2	56	
50	100		0.6	40	
37.5	98		0.3	34	
20	93		0.15	31	
14	89		0.063	31	



REMARKS
As received moisture content = 16%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

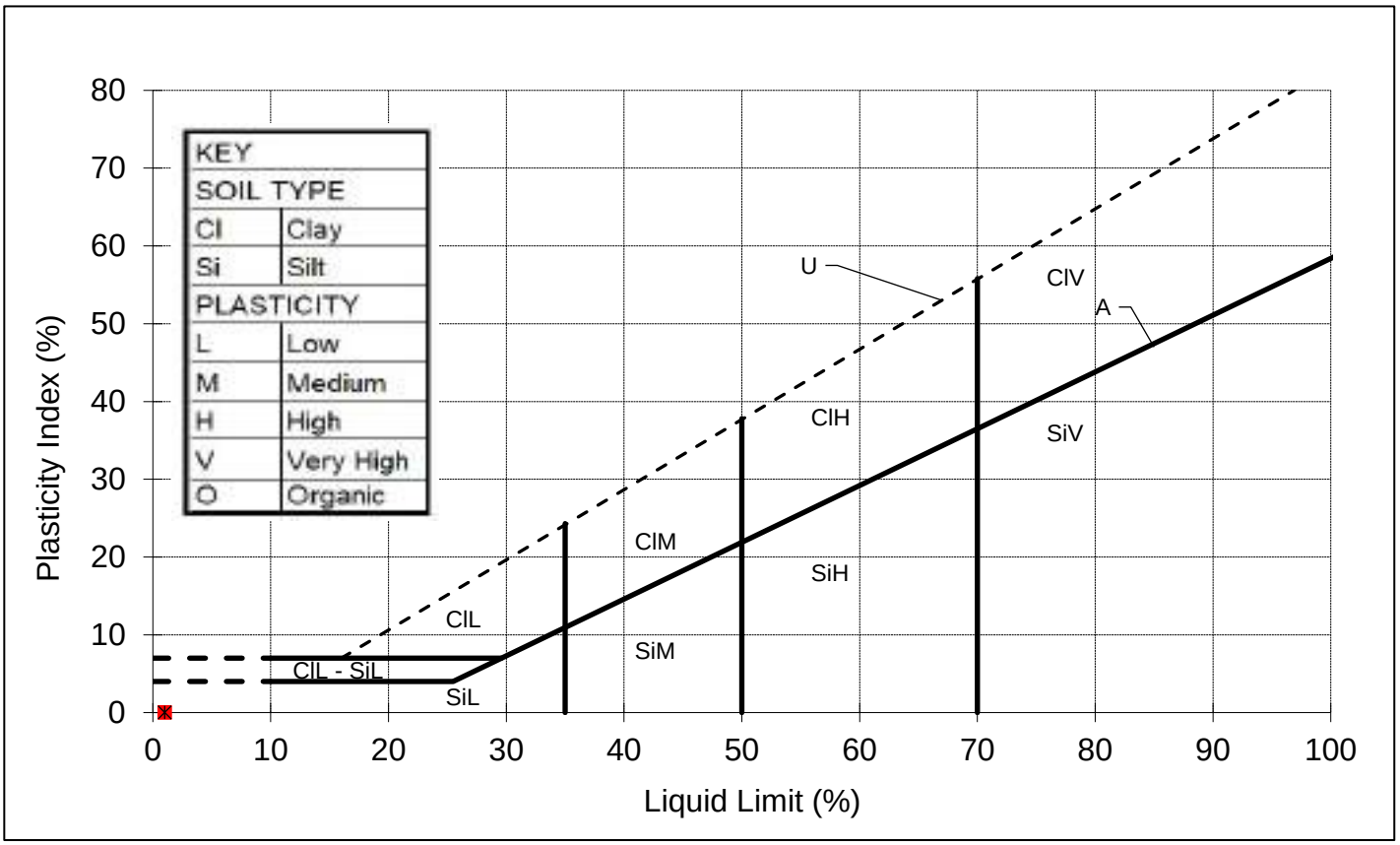
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-B15-L7-Black Fines	DATE SAMPLED	22-Sep-22
SAMPLE No.	116902	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L7 B15

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
16	N/A	Non Plastic	N/A	37



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

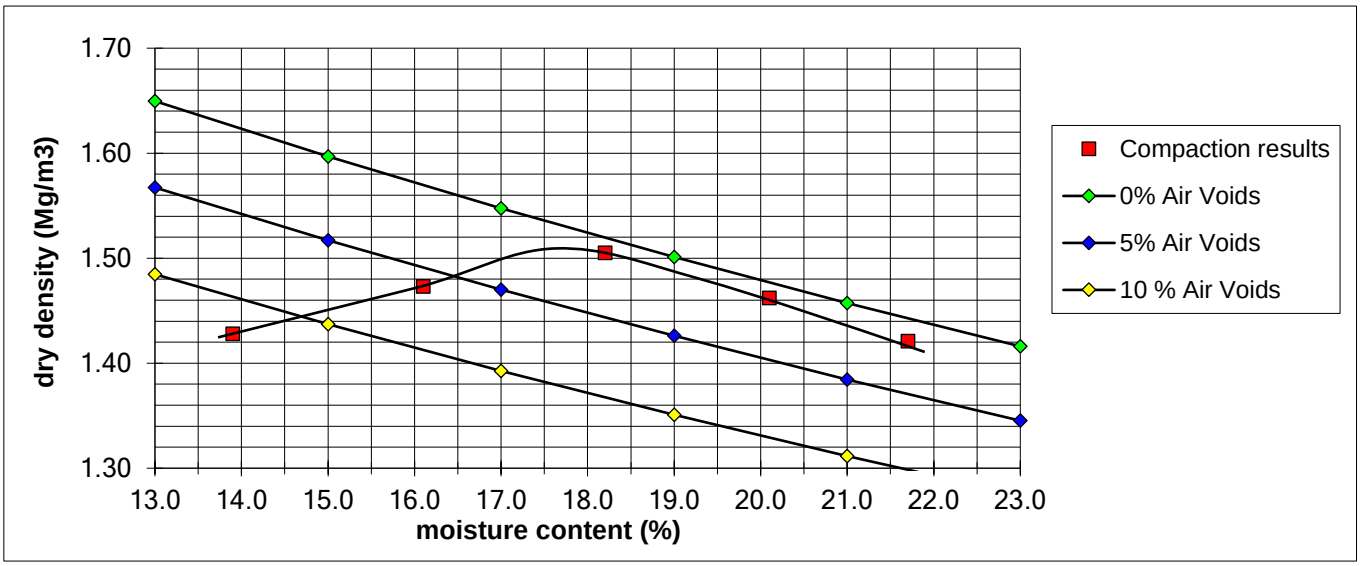
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-B15-L7-Black Fines	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116902	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L7 B15
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	13.9	1.428
2	16.1	1.473
3	18.2	1.505
4	20.1	1.462
5	21.7	1.421
Optimum	18.0	
Maximum		1.51
Particle Density	2.10 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 2%
Percentage of material retained on 20mm sieve = 7%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

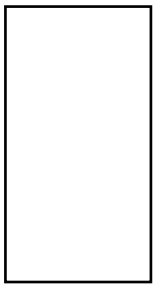
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/76

SAMPLE LABEL	Preclass-B15-L7-Black Fines	DATE SAMPLED	22-Sep-22
LAB SAMPLE No	116902	DATE RECEIVED	22-Sep-22
DATE TESTED	27-Sep-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - L7 B15

SPECIMEN LENGTH	N/A	mm
SPECIMEN DIAMETER	N/A	mm
MOISTURE CONTENT OF SAMPLE	25	%
BULK DENSITY	1.66	Mg/m3
DRY DENSITY	1.33	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	N/A	%/min
RUBBER MEMBRANE THICKNESS	N/A	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
N/A	N/A	N/A	N/A	N/A

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer, Sample did not hold together for test after re-compaction.

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/77
Date of Issue 13 October 2022
Page 1 of 13

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

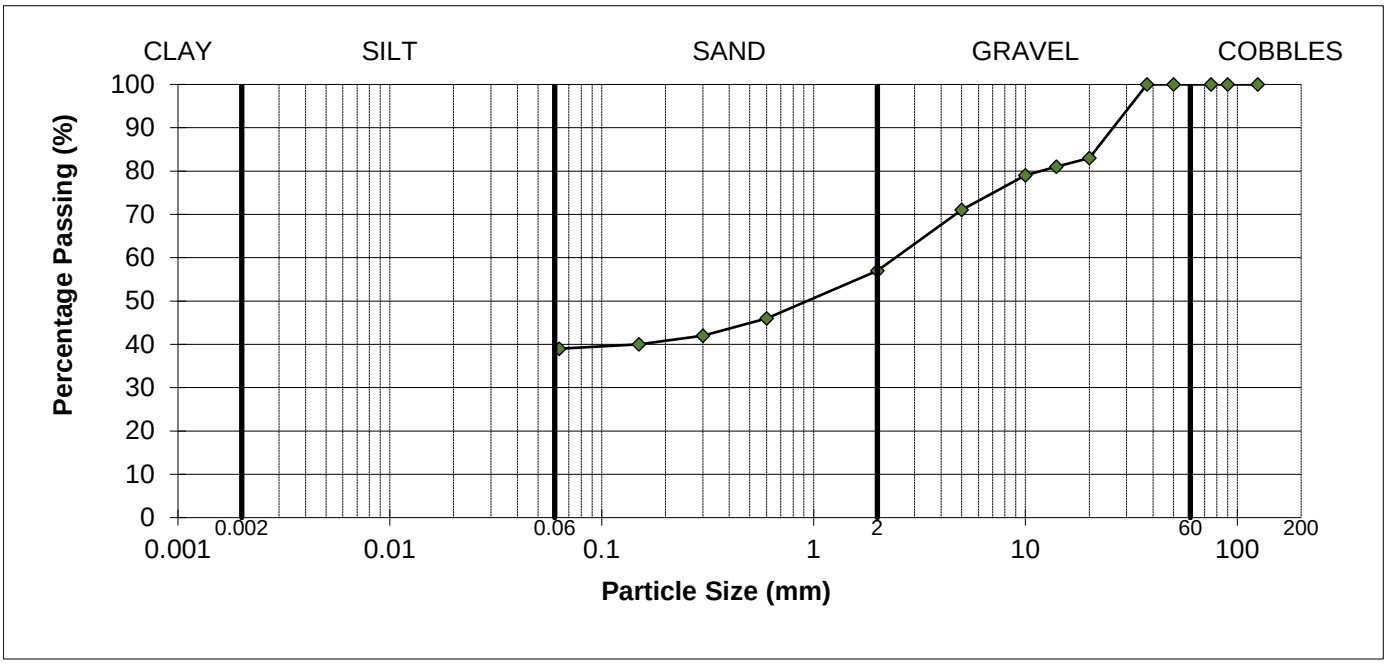
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	Preclass - SP - B19	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117130	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - SP B19

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	79	
90	100		5	71	
75	100		2	57	
50	100		0.6	46	
37.5	100		0.3	42	
20	83		0.15	40	
14	81		0.063	39	



REMARKS
As received moisture content = 22%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

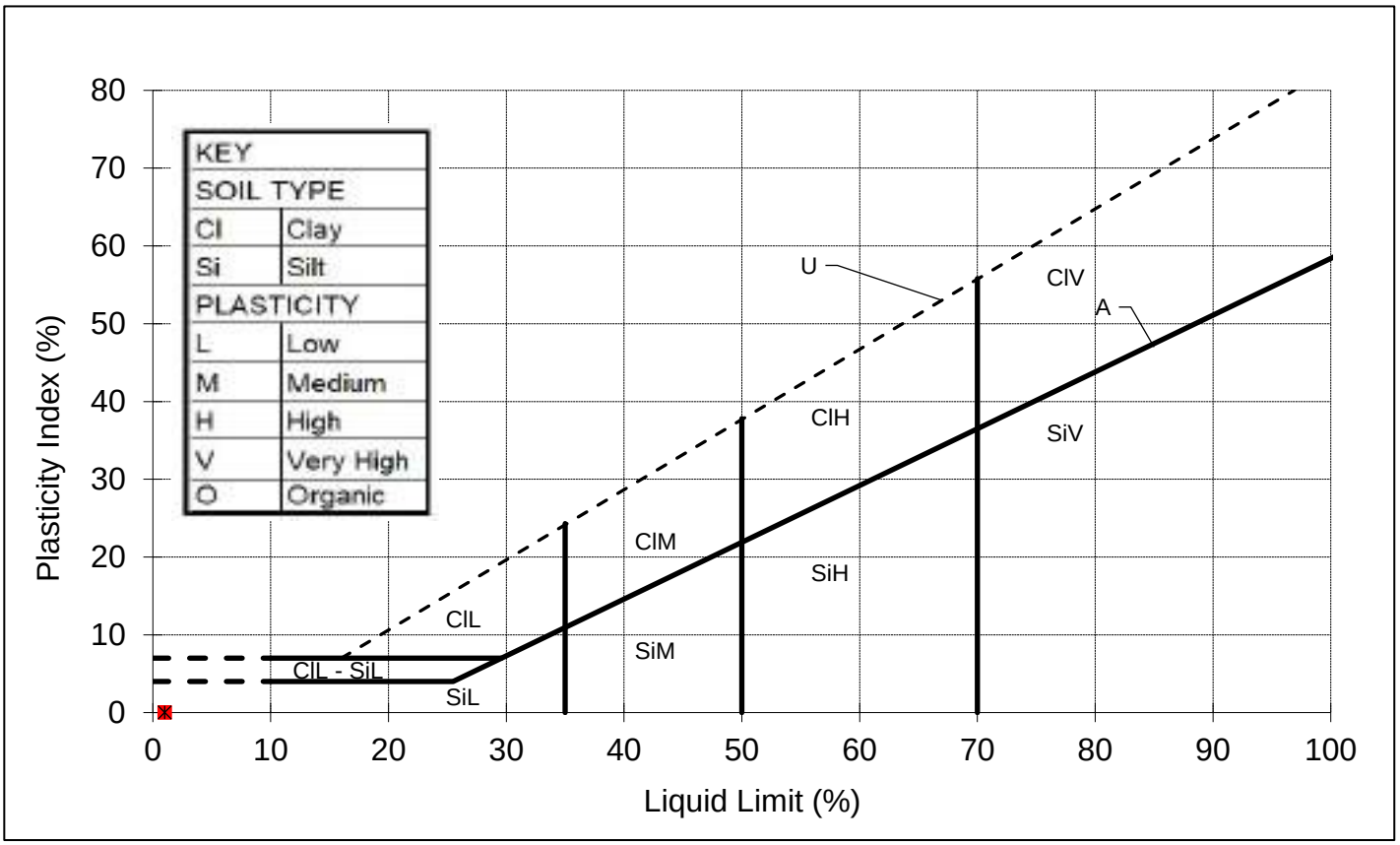
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	Preclass - SP - B19	DATE SAMPLED	23-Sep-22
SAMPLE No.	117130	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - SP B19

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22	N/A	Non Plastic	N/A	44



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

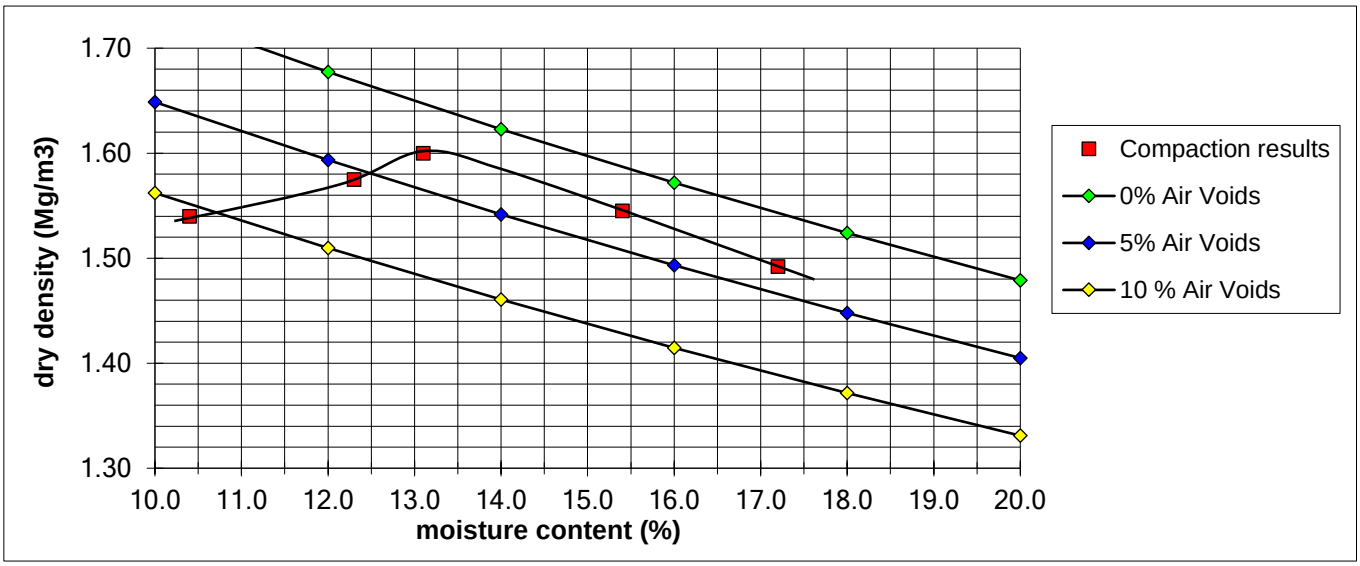
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	Preclass - SP - B19	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117130	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - SP B19
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	10.4	1.540
2	12.3	1.575
3	13.1	1.600
4	15.4	1.545
5	17.2	1.492
Optimum	13.0	
Maximum		1.60
Particle Density	2.10 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 0%
Percentage of material retained on 20mm sieve = 17%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

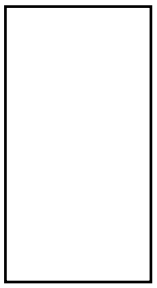
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	Preclass - SP - B19	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117130	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - SP B19

SPECIMEN LENGTH	205	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	22	%
BULK DENSITY	1.62	Mg/m3
DRY DENSITY	1.33	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	11	1.50	514.4	257

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

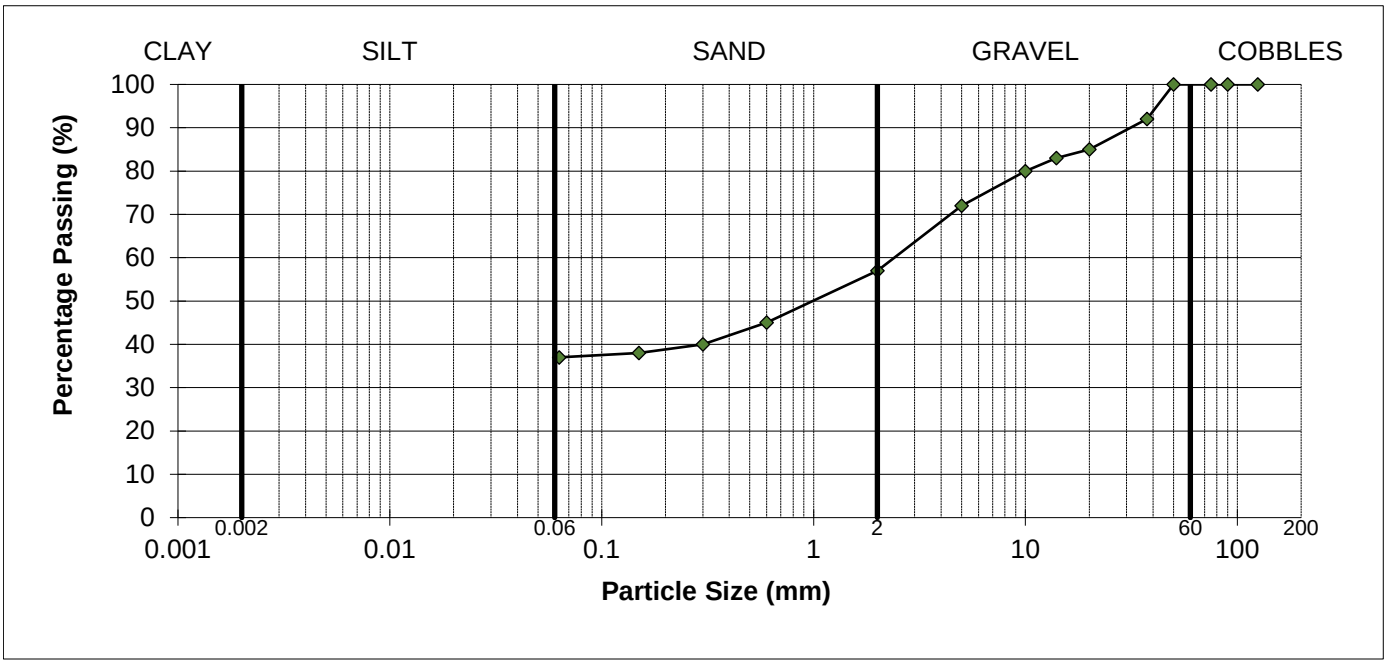
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	B19-L1	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117131	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - B19, L1

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	80	
90	100		5	72	
75	100		2	57	
50	100		0.6	45	
37.5	92		0.3	40	
20	85		0.15	38	
14	83		0.063	37	



REMARKS
As received moisture content = 22%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

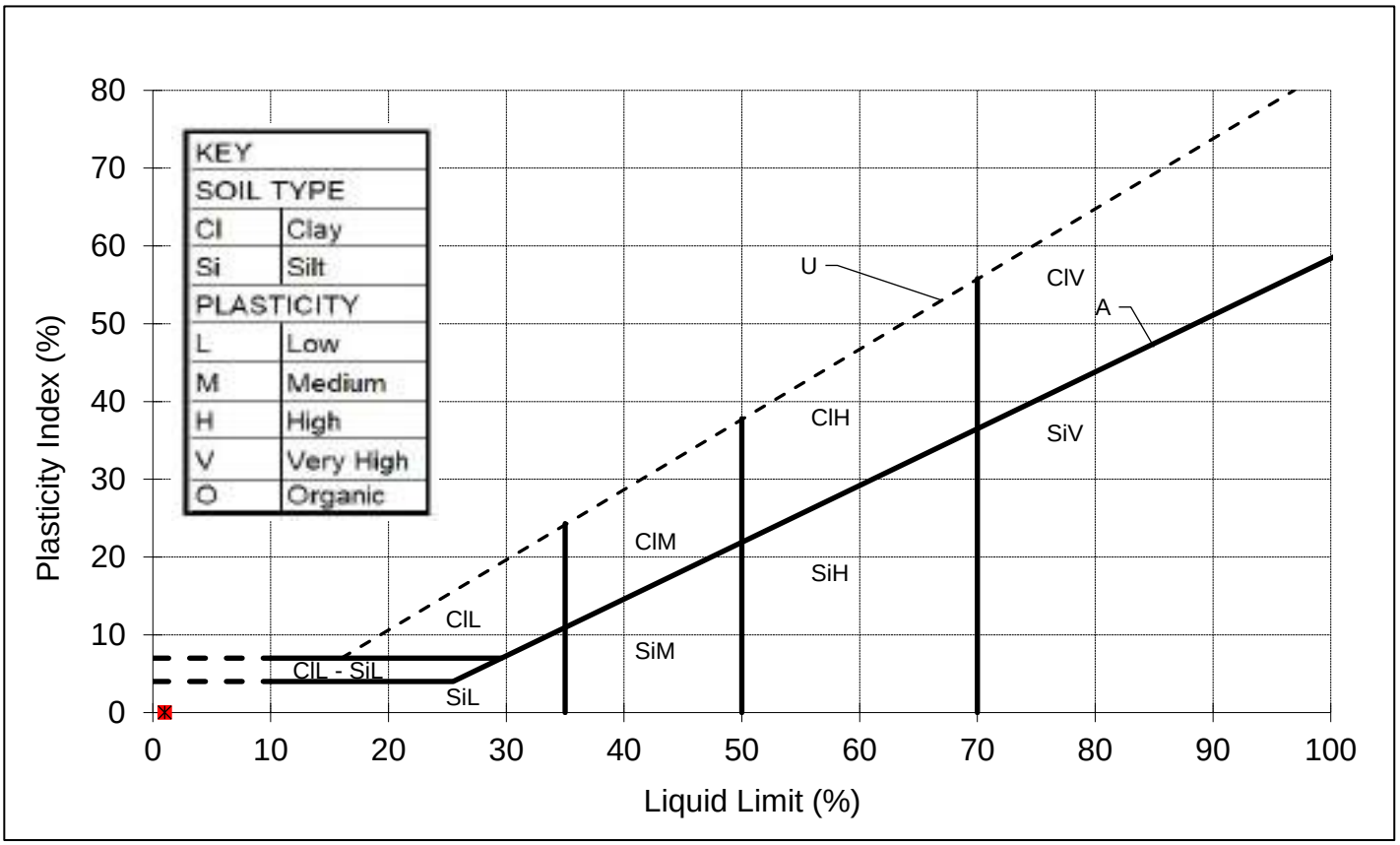
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	B19-L1	DATE SAMPLED	23-Sep-22
SAMPLE No.	117131	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - B19, L1

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22	N/A	Non Plastic	N/A	42



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

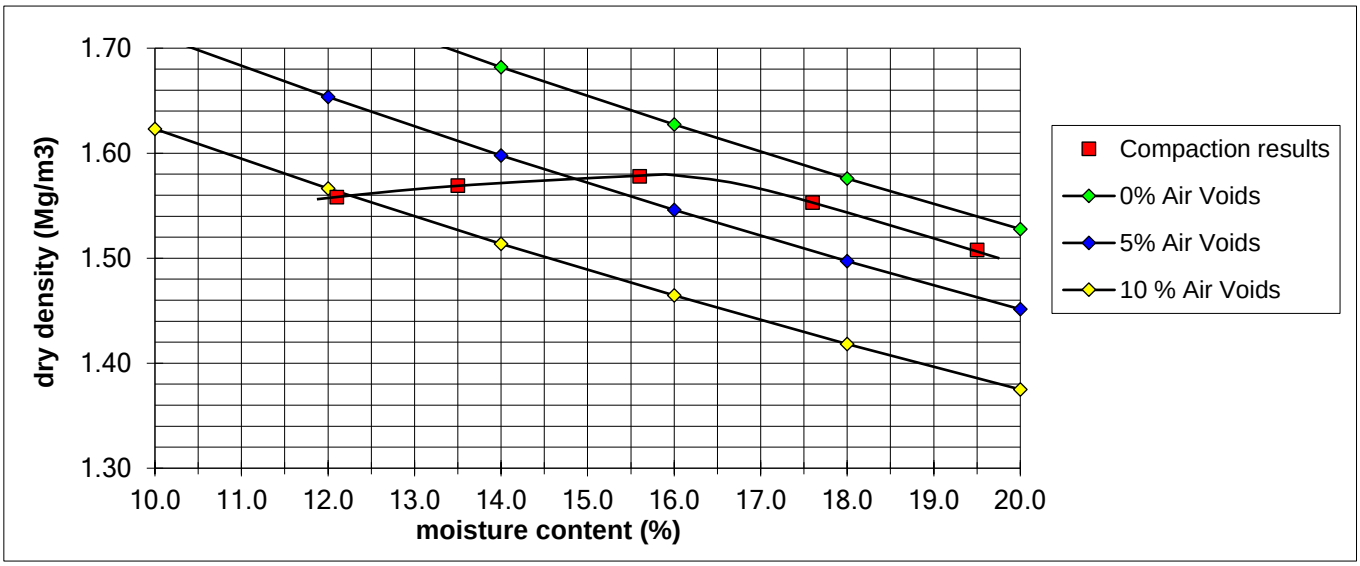
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	B19-L1	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117131	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - B19, L1
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	12.1	1.558
2	13.5	1.569
3	15.6	1.578
4	17.6	1.553
5	19.5	1.508
Optimum	16.0	
Maximum		1.58
Particle Density	2.20 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 8%
Percentage of material retained on 20mm sieve = 15%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

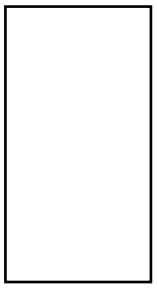
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	B19-L1	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117131	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Black Ash/SAND
ADVISED SOURCE	Site Won - B19, L1

SPECIMEN LENGTH	205	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	22	%
BULK DENSITY	1.66	Mg/m3
DRY DENSITY	1.36	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	5	0.84	898.1	449

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

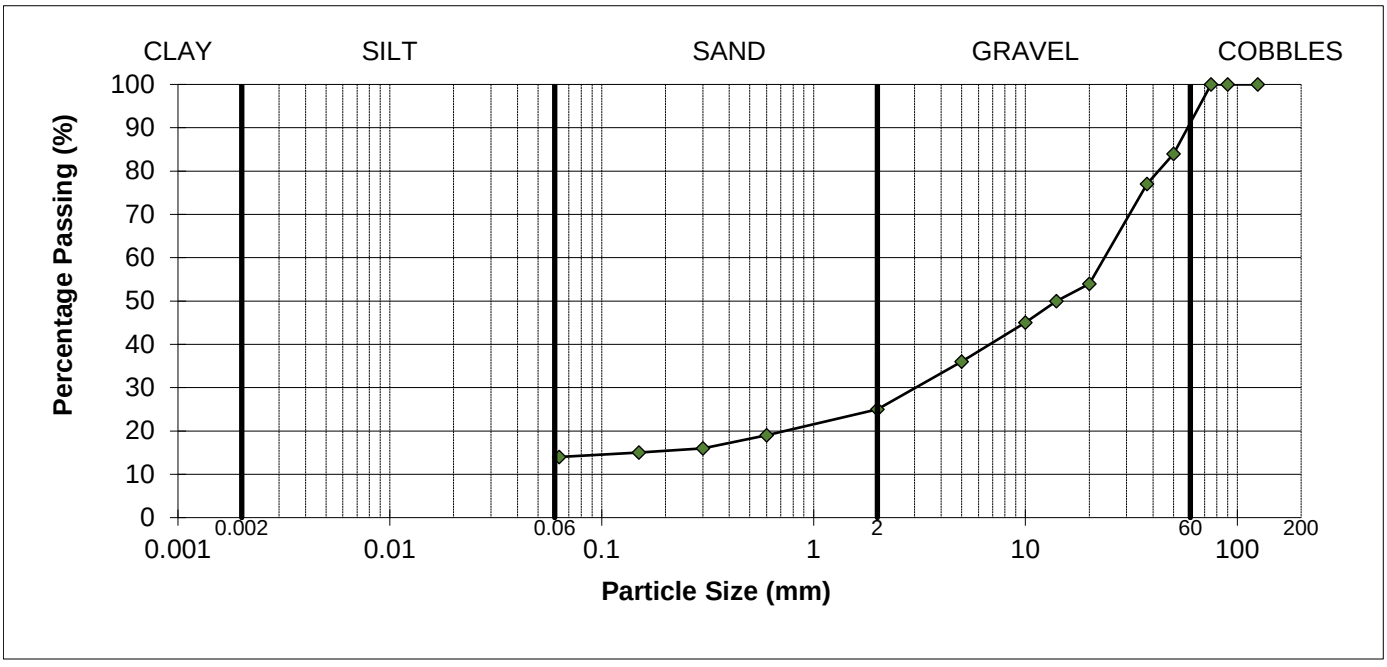
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	A18-L2	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117132	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Brown Ash/SAND
ADVISED SOURCE	Site Won - A18, L2

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	45	
90	100		5	36	
75	100		2	25	
50	84		0.6	19	
37.5	77		0.3	16	
20	54		0.15	15	
14	50		0.063	14	



REMARKS
As received moisture content = 10%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

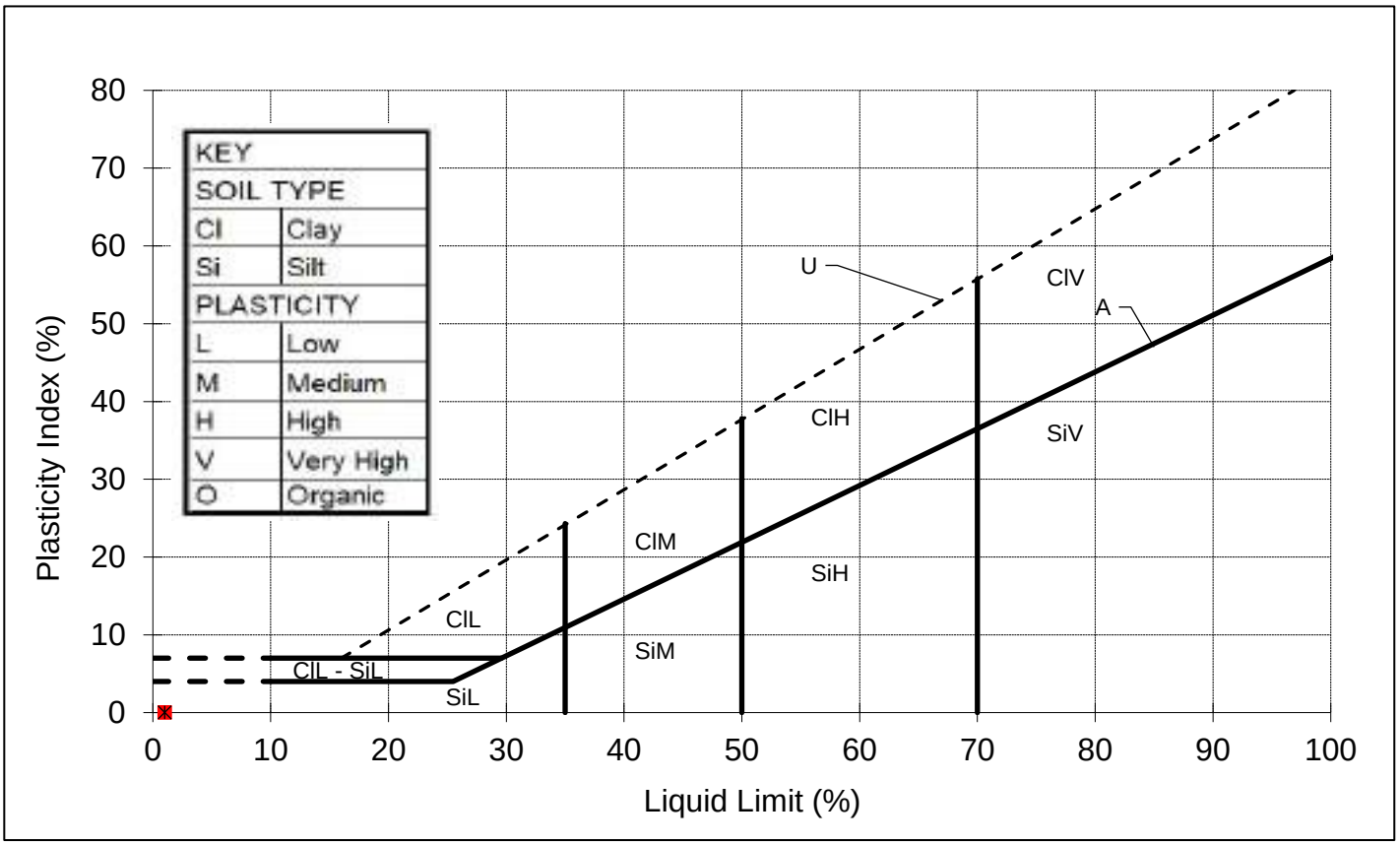
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	A18-L2	DATE SAMPLED	23-Sep-22
SAMPLE No.	117132	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Brown Ash/SAND
ADVISED SOURCE	Site Won - A18, L2

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10	N/A	Non Plastic	N/A	18



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

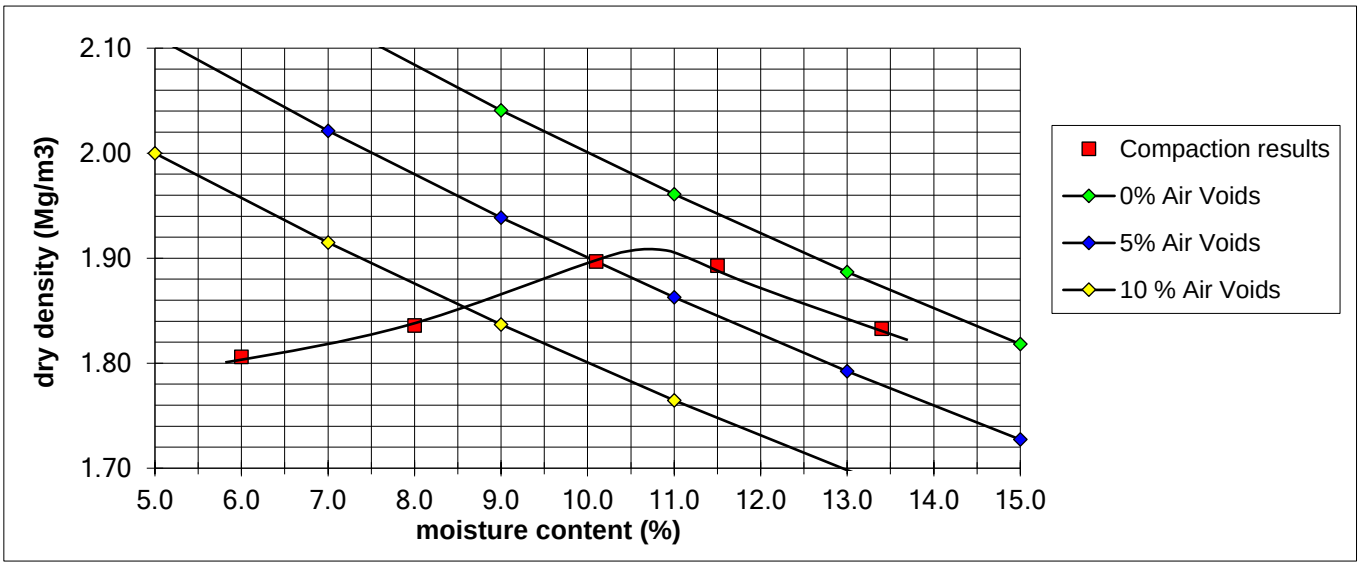
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	A18-L2	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117132	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Brown Ash/SAND
ADVISED SOURCE	Site Won - A18, L2
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	6.0	1.806
2	8.0	1.836
3	10.1	1.897
4	11.5	1.893
5	13.4	1.833
Optimum	11.0	
Maximum		1.91
Particle Density	2.50 (Assumed)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 8%
Percentage of material retained on 20mm sieve = 15%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

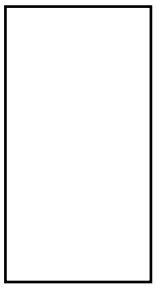
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/77

SAMPLE LABEL	A18-L2	DATE SAMPLED	23-Sep-22
LAB SAMPLE No	117132	DATE RECEIVED	29-Sep-22
DATE TESTED	30-Sep-22	SAMPLED BY	Client

MATERIAL	Brown Ash/SAND
ADVISED SOURCE	Site Won - A18, L2

SPECIMEN LENGTH	205	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	13	%
BULK DENSITY	2.05	Mg/m3
DRY DENSITY	1.81	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	11	1.32	772.1	386

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/78
Date of Issue 13 October 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

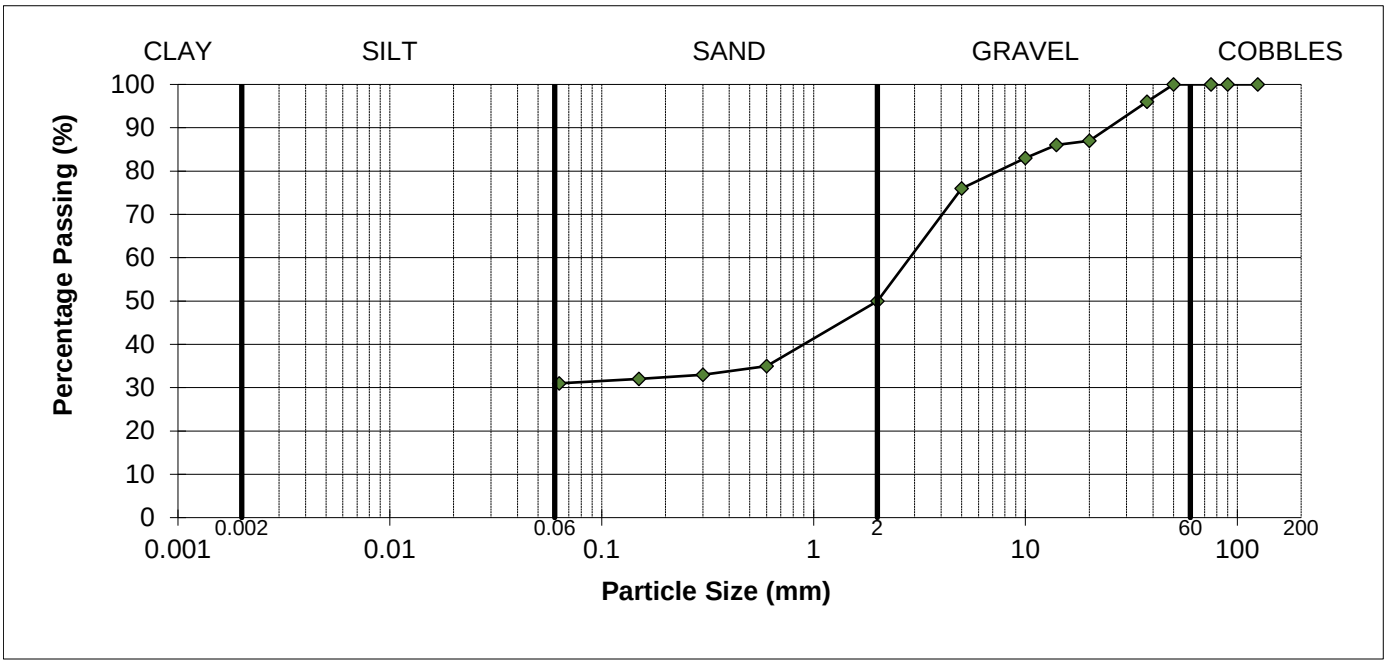
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/78

SAMPLE LABEL	Preclass-tp-F13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117356	DATE RECEIVED	06-Oct-22
DATE TESTED	07-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP F13

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	83	
90	100		5	76	
75	100		2	50	
50	100		0.6	35	
37.5	96		0.3	33	
20	87		0.15	32	
14	86		0.063	31	



REMARKS
As received moisture content = 10%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

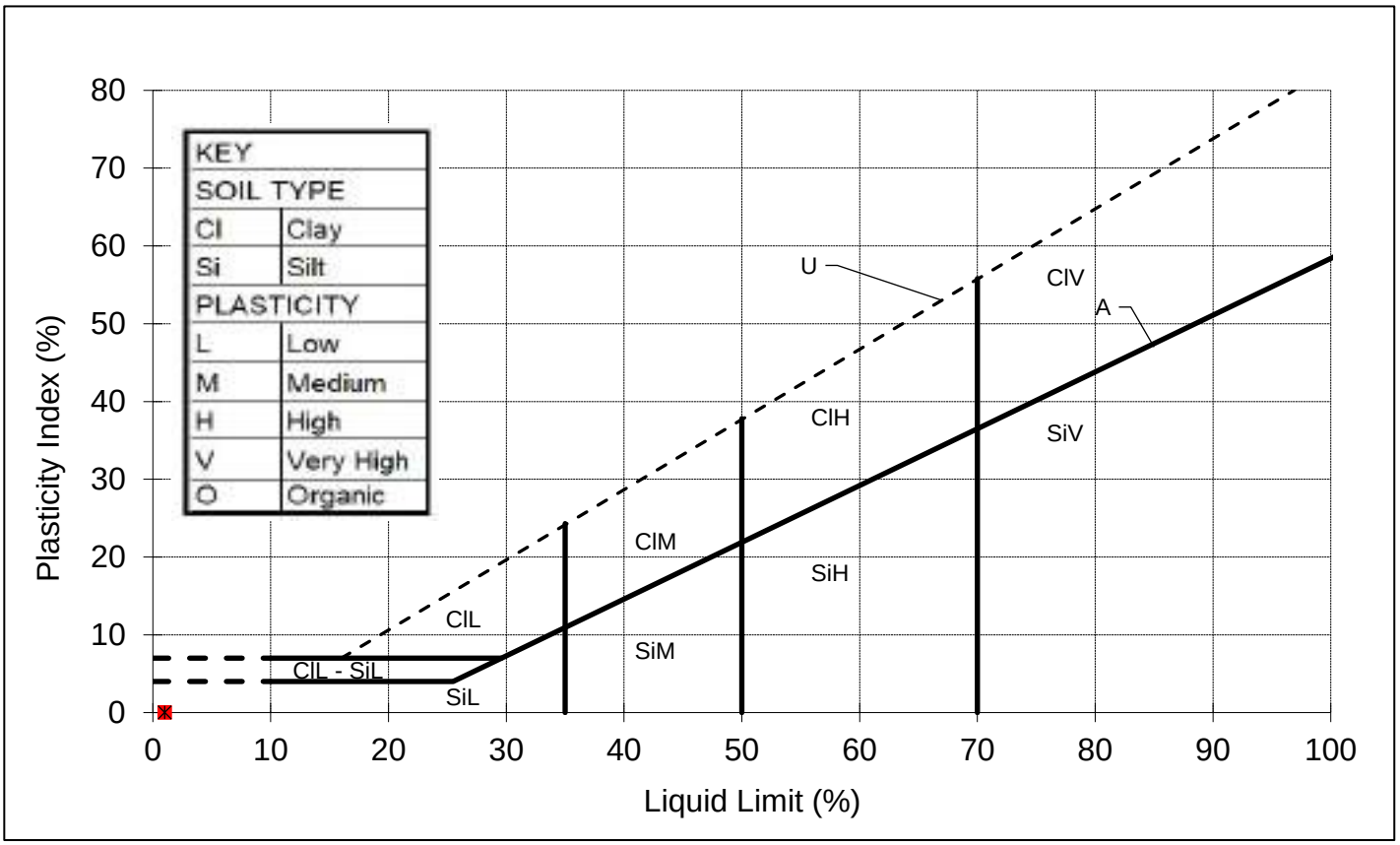
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/78

SAMPLE LABEL	Preclass-tp-F13-1m	DATE SAMPLED	06-Oct-22
SAMPLE No.	117356	DATE RECEIVED	06-Oct-22
DATE TESTED	07-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP F13

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10	N/A	Non Plastic	N/A	34



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 13-Oct-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

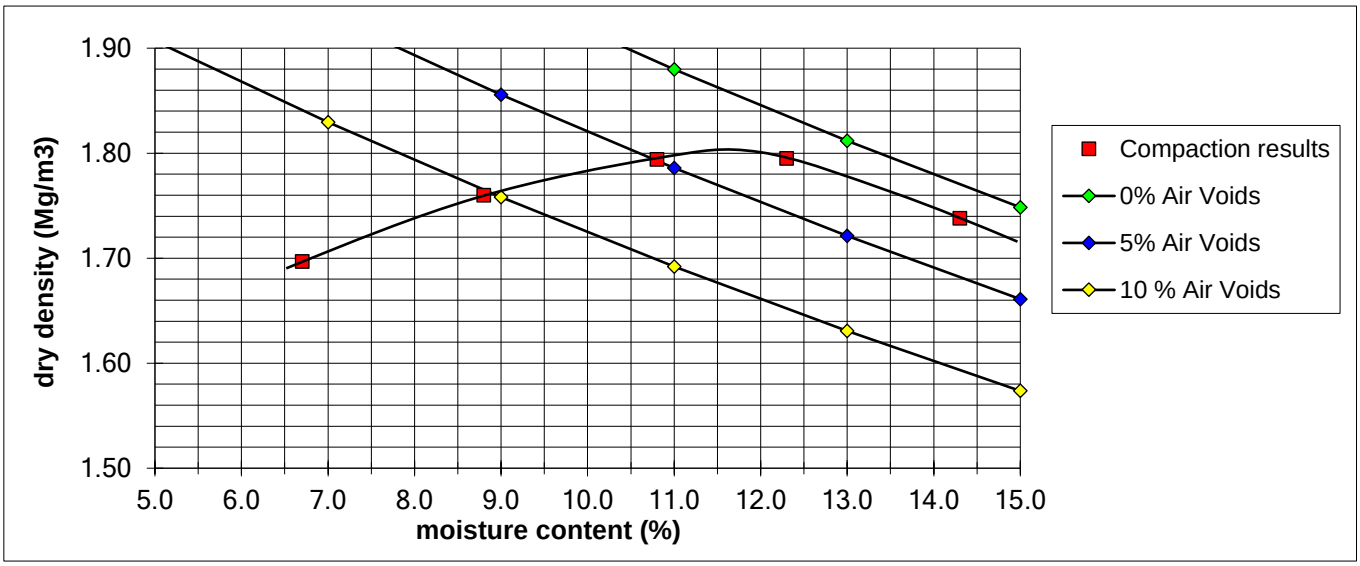
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/78

SAMPLE LABEL	Preclass-tp-F13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117356	DATE RECEIVED	06-Oct-22
DATE TESTED	07-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP F13
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		6.7	1.697
2		8.8	1.760
3		10.8	1.794
4		12.3	1.795
5		14.3	1.738
	Optimum	12.0	
	Maximum		1.80
	Particle Density	2.37 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 4%
Percentage of material retained on 20mm sieve = 13%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

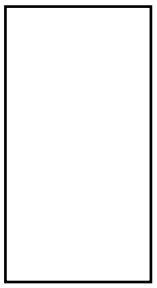
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/78

SAMPLE LABEL	Preclass-tp-F13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117356	DATE RECEIVED	06-Oct-22
DATE TESTED	07-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP F13

SPECIMEN LENGTH	N/A	mm
SPECIMEN DIAMETER	N/A	mm
MOISTURE CONTENT OF SAMPLE	9.0	%
BULK DENSITY	1.87	Mg/m3
DRY DENSITY	1.71	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	N/A	%/min
RUBBER MEMBRANE THICKNESS	N/A	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
N/A	N/A	N/A	N/A	N/A

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer, Sample did not hold together for test after re-compaction.

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/79
Date of Issue 13 October 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	12-Oct-22	**JOB NUMBER**	MRN 4454/79
MATERIAL	Yellow Gravel		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	G18 L1	225	2.18	2.04	6.9	96.2	3.5
2	G18 L2	225	2.17	2.04	6.5	96.1	3.2
3	G18 L3	225	2.15	2.01	6.8	95.0	8.6
4	G18 L4	225	2.16	2.03	6.6	95.6	6.6
5	G18 L5	225	2.17	2.05	6.1	96.5	4.5
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	2.12	(Advised by client)	
				Particle Density (Mg/m3)	2.65	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	12-Oct-22	**JOB NUMBER**	MRN 4454/79
MATERIAL	Black Ash Sand/Gravel		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D16 L8	225	1.84	1.60	15	101.7	2.8
2	D18 L7	225	1.82	1.57	16	100.1	2.8
3	B18 L3	225	1.78	1.55	15	98.6	5.8
4	C16 L7	225	1.86	1.62	15	103.2	1.4
5	C16 L8	225	1.85	1.59	16	101.6	1.3
6	B19 L3	225	1.75	1.54	14	97.8	8.1
7	D17 L7	225	1.81	1.58	15	100.3	4.1
8	B18 L4	225	1.83	1.60	14	102.2	3.9
9	A18 L4	225	1.77	1.54	15	97.9	6.5
10	A19 L3	225	1.78	1.55	15	98.6	5.7
11	D16 L7	225	1.74	1.53	14	97.2	8.6
12	B19 L4	225	1.76	1.57	12	100.1	9.1
13	C17 L8	225	1.75	1.52	15	96.9	7.4
14	A18 L3	225	1.79	1.56	15	99.1	5.3
15	C18 L7	225	1.75	1.54	14	97.8	8.1
16	A19 L4	225	1.76	1.56	13	99.2	8.3
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.57	(Advised by client)	
				Particle Density (Mg/m3)	2.18	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/79

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	12/10/2022
DATE OF TEST	12/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	13/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117657	SRD G18 L4	Yellow Gravel	2.18	2.02	8.0	95.2	7.7
		Maximum Dry Density (Mg/m^3)		2.12		(Advised by client)	
		Particle Density (Mg/m^3)		2.65		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/79

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	12/10/2022
DATE OF TEST	12/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	13/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117658	SRD B19 L3	Black Ash/Sand Gravel	1.78	1.53	16	97.7	5.0
		Maximum Dry Density (Mg/m^3)		1.57		(Advised by client)	
		Particle Density (Mg/m^3)		2.18		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 13-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/80
Date of Issue 18 October 2022
Page 1 of 9

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/80		
TEST LOCATION	I13 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	17-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4988	4863	4889	4913	0.00	0.00	0.0
4833	4695	4747	4758	-1.55	9.00	31.8
4886	4739	4796	4807	-1.06	0.00	0.0
4855	4695	4765	4772	-1.42	2.00	7.1
4829	4662	4735	4742	-1.71	5.00	17.7
4801	4620	4705	4709	-2.05	10.00	35.4
4771	4584	4667	4674	-2.39	11.00	38.9
4739	4544	4633	4639	-2.75	13.00	46.0
4710	4507	4600	4606	-3.08	14.00	49.5
4796	4586	4661	4681	-2.32	0.00	0.0
4777	4548	4636	4654	-2.60	3.00	10.6
4752	4508	4604	4621	-2.92	5.00	17.7
4716	4473	4575	4588	-3.25	6.00	21.2
4682	4441	4544	4556	-3.58	11.00	38.9
4652	4407	4507	4522	-3.91	13.00	46.0
4633	4372	4475	4493	-4.20	15.00	53.1
4734	4518	4590	4614	-2.99	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	38	kPa
Modulus of subgrade reaction (k) =	30	MPa/m
Equivalent 762 mm plate reaction =	25	MPa/m
Equivalent CBR =	2.5	%
Surface Stiffness Modulus (E) =	31	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	39	kPa
Modulus of subgrade reaction (k) =	31	MPa/m
Equivalent 762 mm plate reaction =	25	MPa/m
Equivalent CBR =	2.5	%
Surface Stiffness Modulus (E) =	32	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

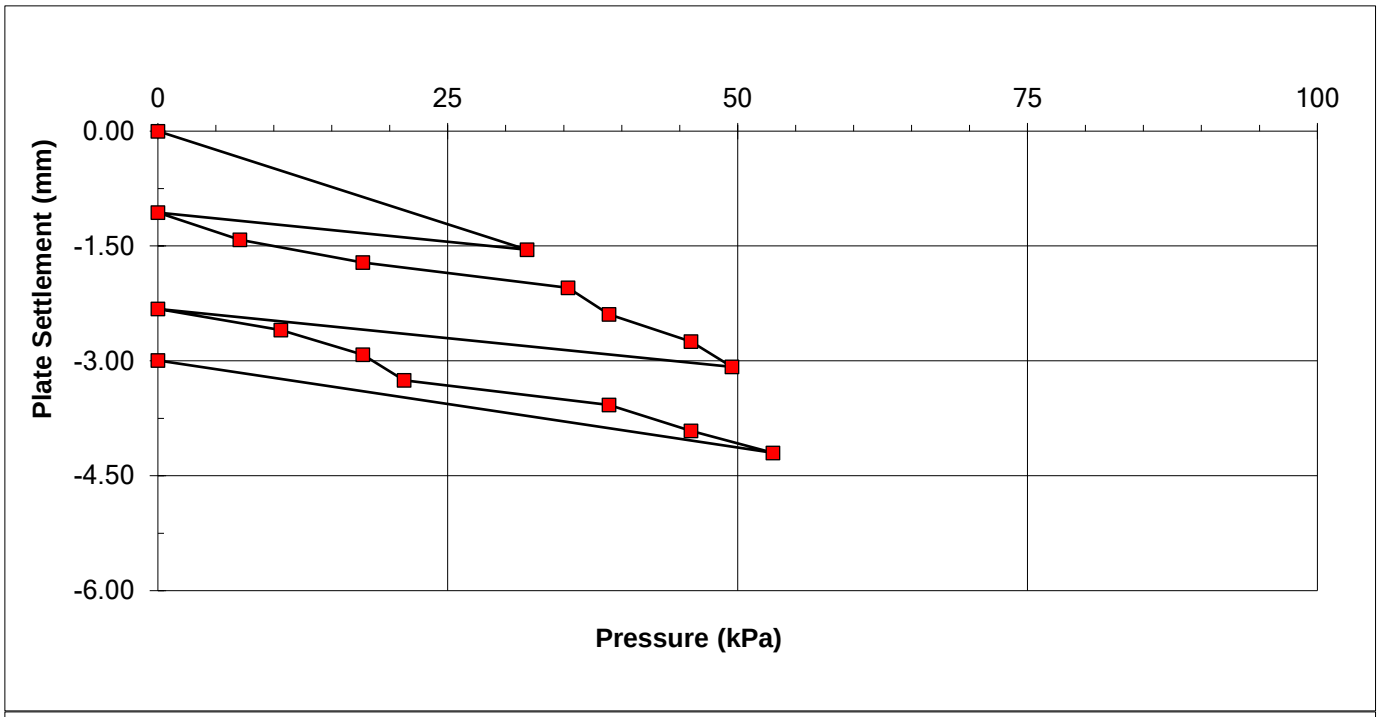
DATE 18-Oct-22

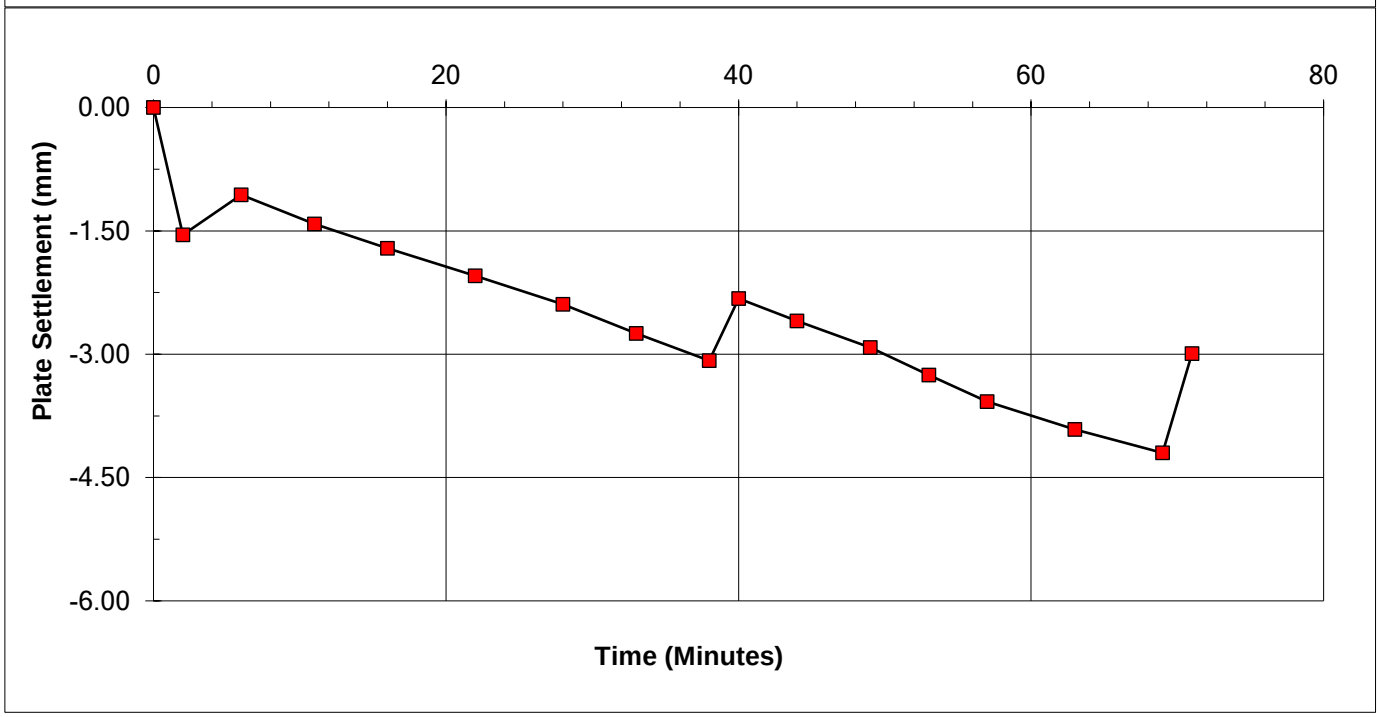
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 18-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/80		
TEST LOCATION	I15 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	17-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4863	4947	4896	4902	0.00	0.00	0.0
4720	4789	4752	4754	-1.48	10.00	35.4
4773	4856	4819	4816	-0.86	0.00	0.0
4742	4829	4786	4786	-1.16	5.00	17.7
4709	4800	4762	4757	-1.45	11.00	38.9
4677	4772	4738	4729	-1.73	13.00	46.0
4637	4742	4709	4696	-2.06	15.00	53.1
4604	4711	4679	4665	-2.37	18.00	63.7
4569	4680	4646	4632	-2.70	20.00	70.7
4776	4754	4788	4773	-1.29	0.00	0.0
4748	4624	4755	4709	-1.93	6.00	21.2
4715	4598	4725	4679	-2.23	10.00	35.4
4683	4563	4695	4647	-2.55	14.00	49.5
4653	4534	4660	4616	-2.86	18.00	63.7
4613	4505	4635	4584	-3.18	21.00	74.3
4582	4473	4604	4553	-3.49	23.00	81.3
4744	4671	4708	4708	-1.94	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	55	kPa
Modulus of subgrade reaction (k) =	44	MPa/m
Equivalent 762 mm plate reaction =	35	MPa/m
Equivalent CBR =	4.6	%
Surface Stiffness Modulus (E) =	47	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	49	kPa
Modulus of subgrade reaction (k) =	39	MPa/m
Equivalent 762 mm plate reaction =	32	MPa/m
Equivalent CBR =	3.8	%
Surface Stiffness Modulus (E) =	42	MN/m^2

Surface Stiffness Modulus Ratio =	0.9

DATE 18-Oct-22

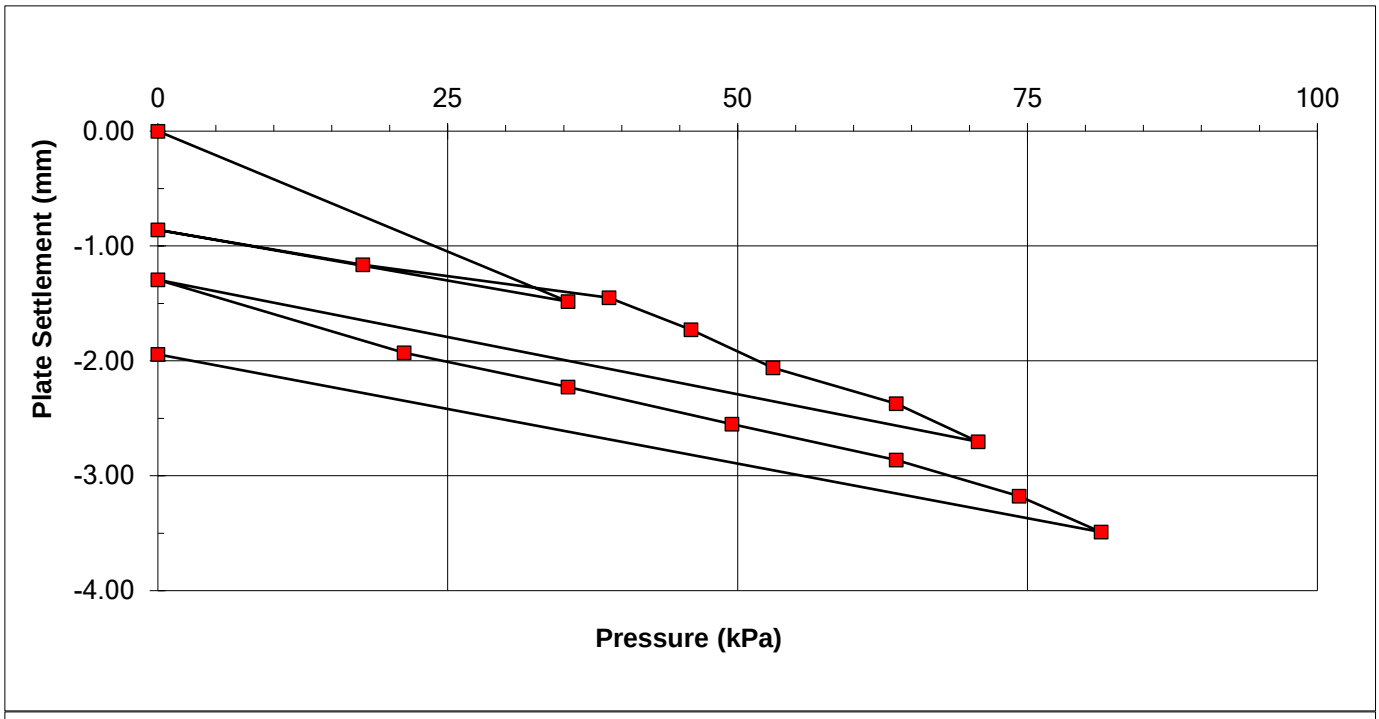
MURRAY RIX

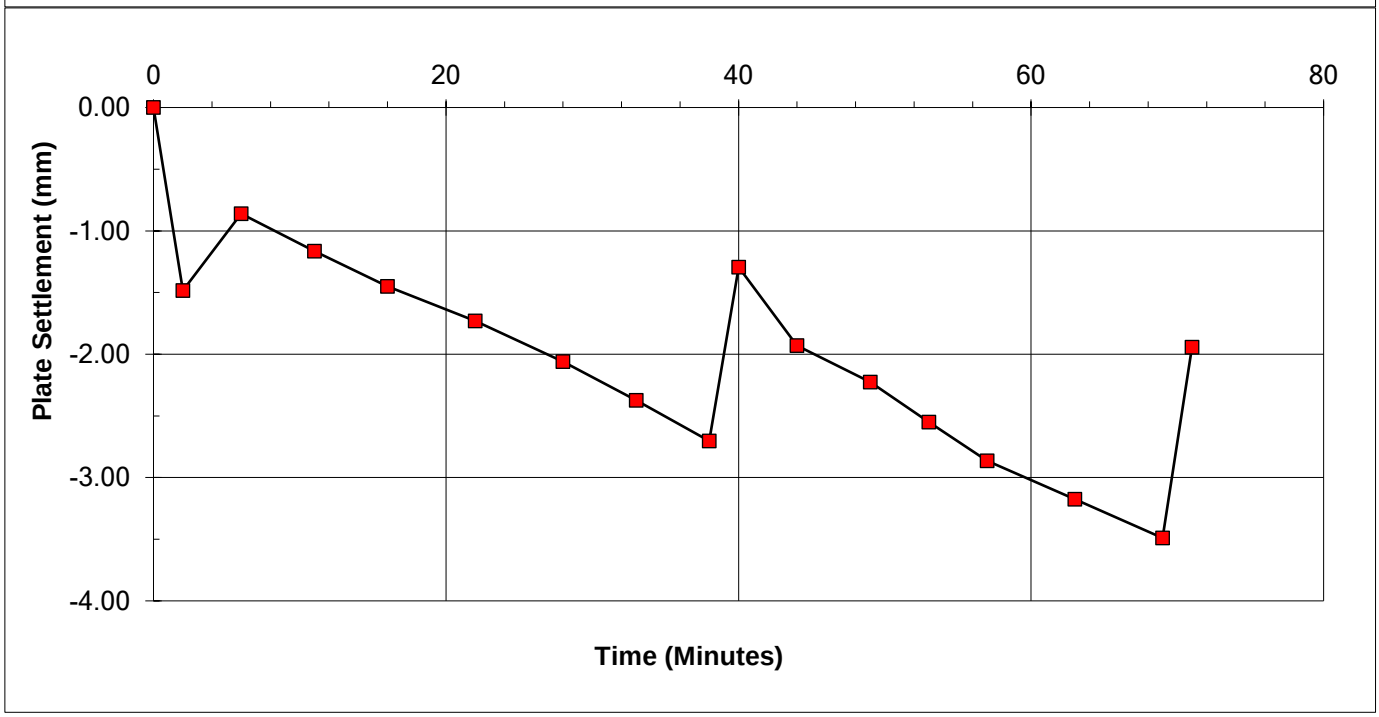
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 18-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/80		
TEST LOCATION	G14 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	17-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4837	4906	4880	4874	0.00	0.00	0.0
4681	4735	4736	4717	-1.57	6.00	21.2
4688	4757	4765	4737	-1.38	0.00	0.0
4667	4737	4731	4712	-1.63	4.00	14.1
4630	4696	4719	4682	-1.93	7.00	24.8
4606	4665	4687	4653	-2.22	9.00	31.8
4588	4636	4665	4630	-2.45	10.00	35.4
4557	4583	4628	4589	-2.85	12.00	42.4
4527	4550	4576	4551	-3.23	14.00	49.5
4633	4693	4718	4681	-1.93	0.00	0.0
4607	4661	4695	4654	-2.20	3.00	10.6
4580	4630	4665	4625	-2.49	5.00	17.7
4551	4597	4634	4594	-2.80	9.00	31.8
4512	4565	4610	4562	-3.12	12.00	42.4
4481	4535	4580	4532	-3.42	14.00	49.5
4450	4509	4552	4504	-3.71	17.00	60.1
4554	4629	4654	4612	-2.62	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	39	kPa
Modulus of subgrade reaction (k) =	31	MPa/m
Equivalent 762 mm plate reaction =	25	MPa/m
Equivalent CBR =	2.5	%
Surface Stiffness Modulus (E) =	32	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	44	kPa
Modulus of subgrade reaction (k) =	35	MPa/m
Equivalent 762 mm plate reaction =	28	MPa/m
Equivalent CBR =	3.1	%
Surface Stiffness Modulus (E) =	37	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

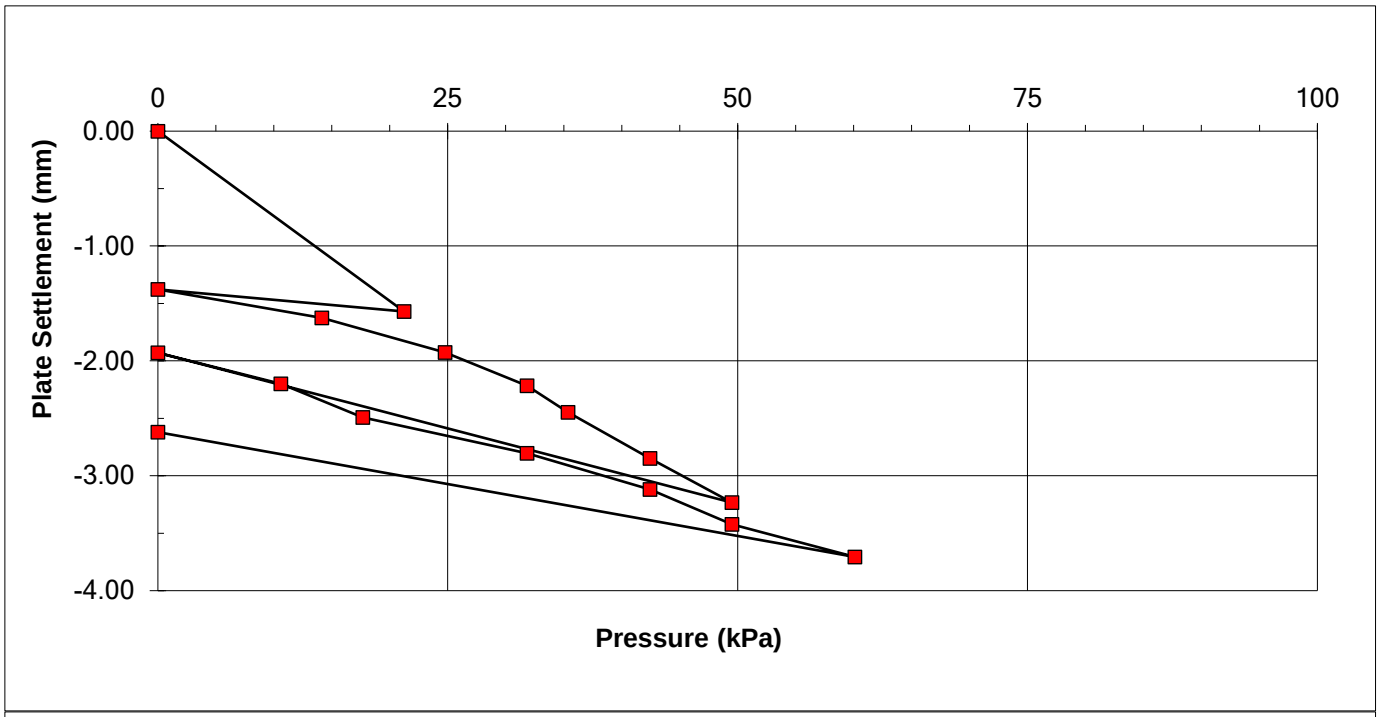
DATE 18-Oct-22

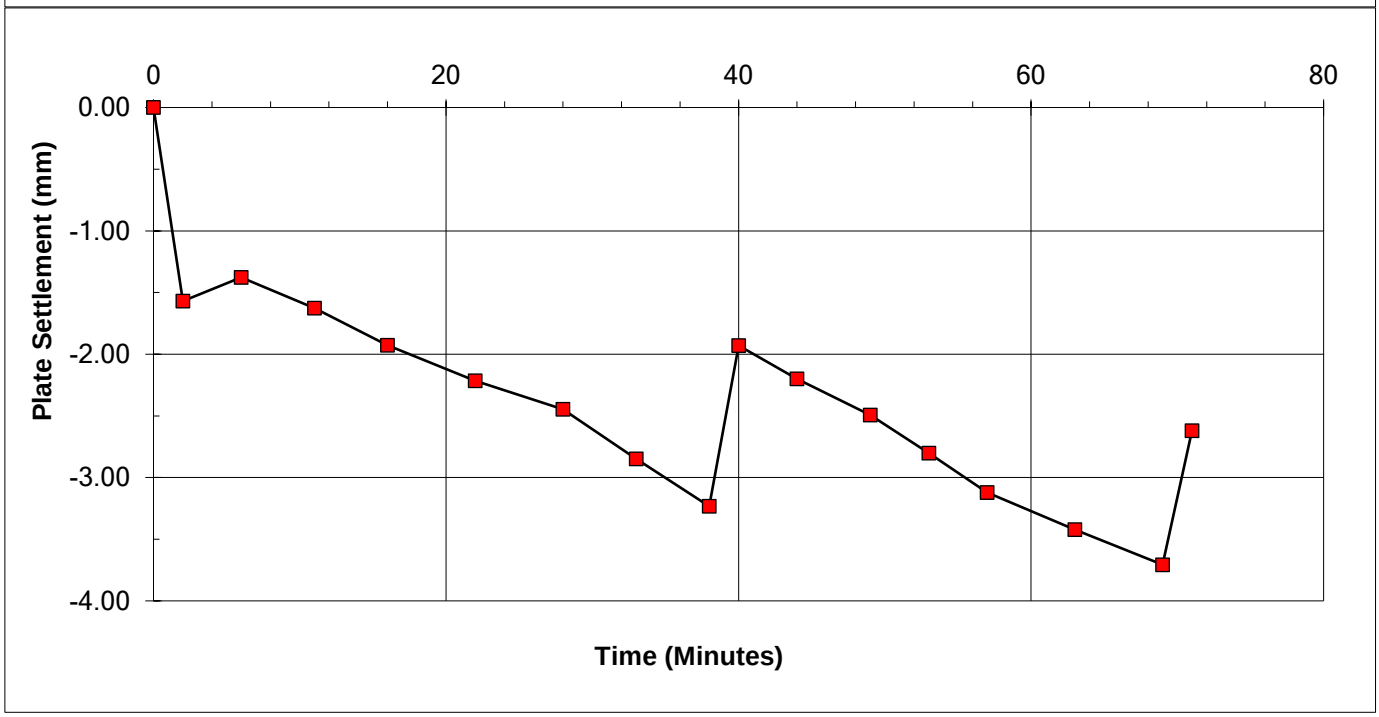
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 18-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/80		
TEST LOCATION	B19 L4	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	17-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4804	4713	4782	4766	0.00	0.00	0.0
4757	4675	4635	4689	-0.77	5.00	17.7
4794	4706	4760	4753	-0.13	0.00	0.0
4779	4691	4740	4737	-0.30	5.00	17.7
4758	4674	4721	4718	-0.49	7.00	24.8
4730	4651	4709	4697	-0.70	9.00	31.8
4700	4626	4684	4670	-0.96	12.00	42.4
4693	4591	4660	4648	-1.18	15.00	53.1
4652	4564	4642	4619	-1.47	18.00	63.7
4728	4677	4725	4710	-0.56	0.00	0.0
4711	4657	4713	4694	-0.73	2.00	7.1
4681	4637	4693	4670	-0.96	5.00	17.7
4662	4618	4649	4643	-1.23	9.00	31.8
4627	4598	4630	4618	-1.48	12.00	42.4
4604	4567	4613	4595	-1.72	16.00	56.6
4586	4546	4590	4574	-1.92	19.00	67.2
4662	4608	4652	4641	-1.26	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	60	kPa
Modulus of subgrade reaction (k) =	48	MPa/m
Equivalent 762 mm plate reaction =	39	MPa/m
Equivalent CBR =	5.5	%
Surface Stiffness Modulus (E) =	52	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	62	kPa
Modulus of subgrade reaction (k) =	49	MPa/m
Equivalent 762 mm plate reaction =	40	MPa/m
Equivalent CBR =	5.7	%
Surface Stiffness Modulus (E) =	53	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

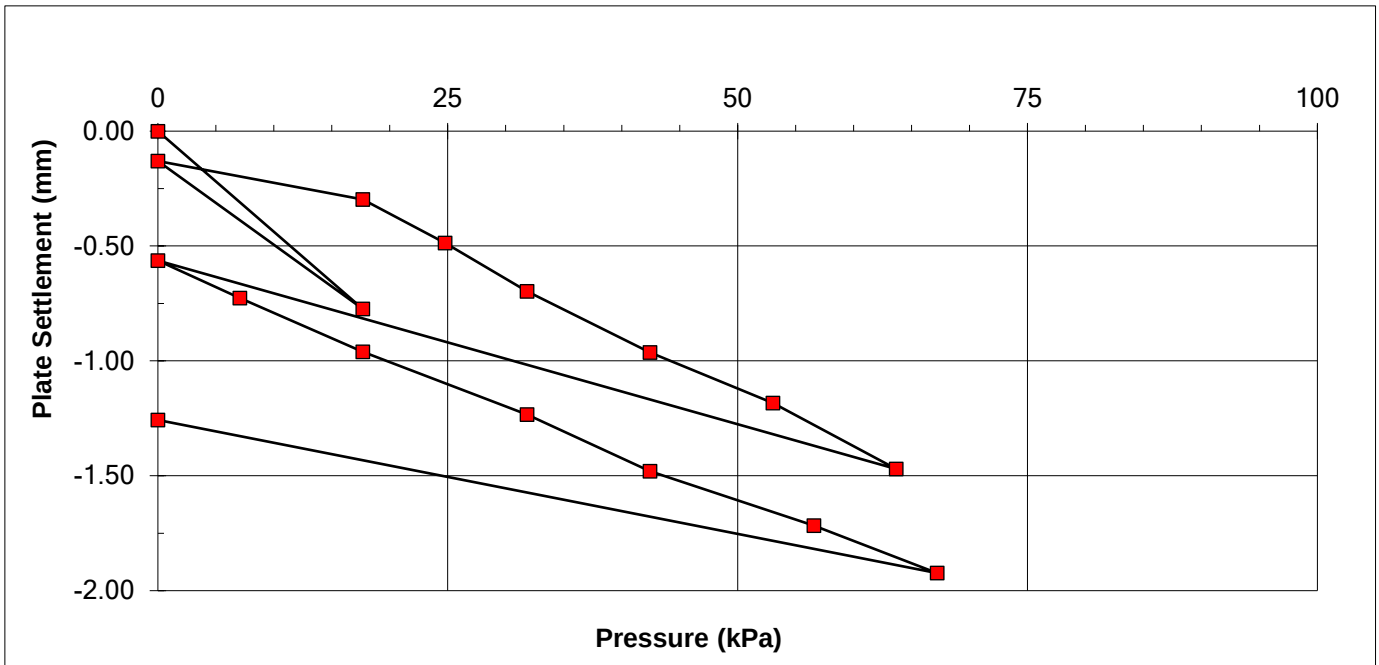
DATE 18-Oct-22

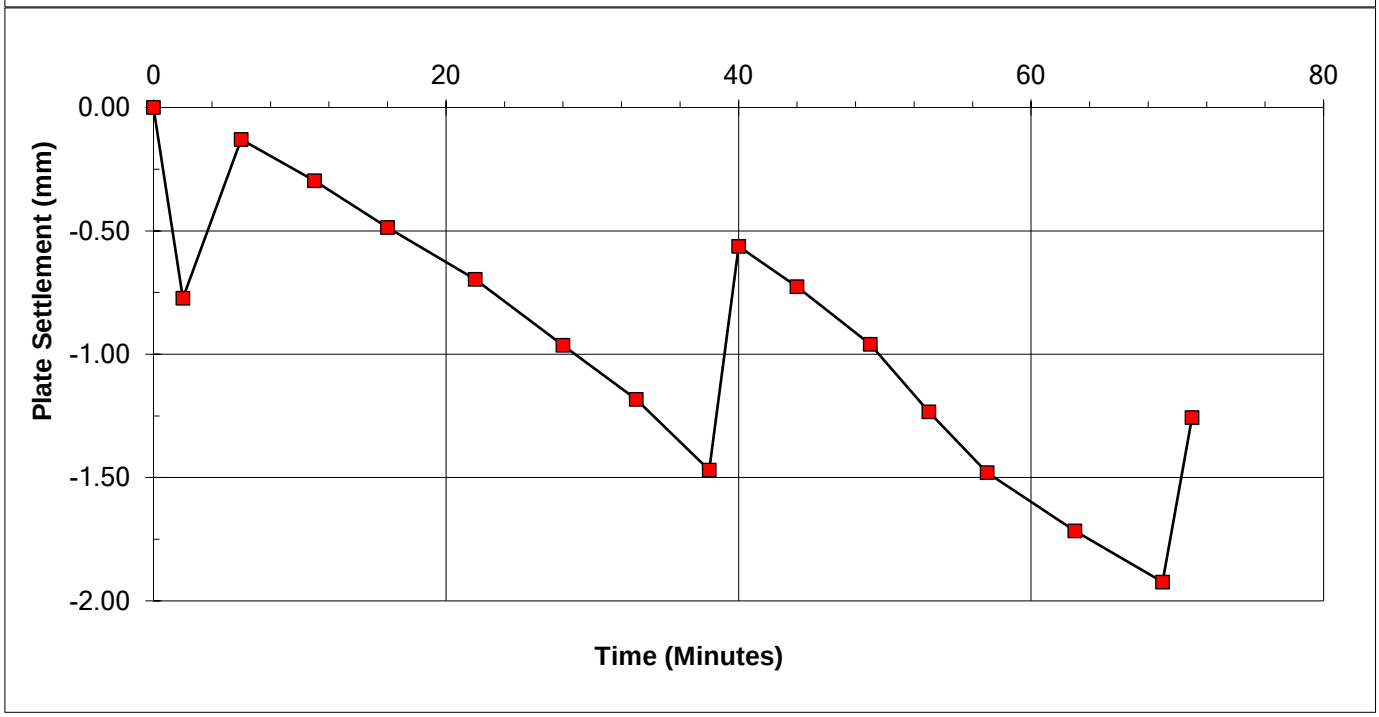
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 18-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/81
Date of Issue 19 October 2022
Page 1 of 3

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	18-Oct-22	**JOB NUMBER**	MRN 4454/81
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C19 L7	225	1.89	1.65	15	99.4	2.6
2	C19 L8	225	1.90	1.64	15	99.0	1.7
3	C19 L9	225	1.86	1.60	16	96.4	3.2
4	C19 L10	225	1.84	1.59	16	96.0	4.2
5	D19 L7	225	1.87	1.62	15	97.8	3.5
6	D19 L8	225	1.88	1.65	14	99.3	3.9
7	D19 L9	225	1.96	1.72	14	103.5	-0.1
8	D19 L10	225	1.86	1.60	16	96.3	3.3
9	B19 L5	225	1.86	1.59	17	95.7	2.5
10	B19 L6	225	1.89	1.63	16	98.4	2.0
11	B19 L7	225	1.91	1.65	16	99.2	0.2
12	B19 L8	225	1.90	1.65	16	99.3	1.2
13	B19 L9	225	1.86	1.65	13	99.6	5.9
14	B19 L10	225	1.93	1.73	12	104.4	3.1
15	A19 L5	225	1.89	1.70	11	102.5	5.6
16	A19 L6	225	1.85	1.64	13	99.0	6.0
17	A19 L7	225	1.86	1.66	12	100.2	6.7
18	A19 L8	225	1.84	1.66	11	100.2	8.4
19	A19 L9	225	1.83	1.64	12	98.8	8.1
20	A19 L10	225	1.91	1.73	10	104.1	5.4
				Maximum Dry Density (Mg/m3)	1.66	(Advised by client)	
				Particle Density (Mg/m3)	2.25	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 19-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/81

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	18/10/2022
DATE OF TEST	18/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	19/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117811	SRD C19 L10	Black Ash/Sand	1.91	1.65	16	99.2	0.5
117812	SRD A19 L10	Black Ash/Sand	1.92	1.67	15	100.6	0.8
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME S.J Hutchings (Director) SIGNED DATE 19-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/82
Date of Issue 20 October 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	19-Oct-22	**JOB NUMBER**	MRN 4454/82
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	A18 L5	225	2.06	1.88	10	99.3	7.4
2	A18 L6	225	2.04	1.86	10	98.4	8.1
3	A18 L7	225	2.06	1.86	10	98.6	6.6
4	A18 L8	225	2.09	1.91	10	100.9	5.6
5	A18 L9	225	2.10	1.92	9.4	101.3	5.7
6	A18 L10	225	2.13	1.96	8.6	103.9	4.8
7	B18 L5	225	2.15	1.96	10	103.7	3.3
8	B18 L6	225	2.18	1.99	10	105.4	1.7
9	B18 L7	225	2.02	1.83	10	96.9	8.2
10	B18 L8	225	2.01	1.84	9.3	97.3	9.6
11	D18 L8	225	2.03	1.82	12	96.2	6.4
12	A16 L9	225	2.13	1.90	12	100.6	1.4
13	B16 L9	225	2.11	1.87	13	98.8	1.3
14	B16 L10	225	2.10	1.87	12	99.1	2.6
15	C20 L6	225	2.00	1.81	11	95.7	8.5
16	C20 L7	225	2.03	1.84	10	97.4	7.6
17	C20 L8	225	2.03	1.84	11	97.1	7.4
18	C20 L9	225	2.03	1.84	11	97.2	7.1
19	C20 L10	225	2.04	1.84	11	97.4	6.9
20	D20 L3	225	2.12	1.95	8.8	103.0	5.4
				Maximum Dry Density (Mg/m3)	1.89	(Advised by client)	
				Particle Density (Mg/m3)	2.51	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 20-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	19-Oct-22	**JOB NUMBER**	MRN 4454/82
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	D20 L4	225	2.12	1.94	9	102.8	5.0
22	D20 L5	225	2.15	1.97	9.1	104.2	3.7
23	D20 L7	225	2.16	1.99	9	105.1	3.2
24	D20 L8	225	2.16	1.98	9	104.8	3.2
25	D20 L9	225	2.16	1.98	9	104.8	3.2
26	E18 L3	225	2.13	1.97	8	104.3	5.2
27	E18 L4	225	2.12	1.94	9	102.6	4.8
28	E18 L5	225	2.11	1.93	9	102.3	5.8
29	E18 L6	225	2.10	1.91	9.7	101.3	5.3
30	C20 L1	225	2.10	1.92	9.2	101.6	5.8
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.89	(Advised by client)	
				Particle Density (Mg/m3)	2.51	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 20-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	19-Oct-22	**JOB NUMBER**	MRN 4454/82
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B18 L9	225	1.97	1.76	12	104.1	5.3
2	B18 L10	225	1.95	1.73	13	102.5	6.1
3	D18 L9	225	1.95	1.74	12	102.8	6.5
4	A17 L9	225	1.89	1.67	13	98.9	8.8
5	A17 L10	225	1.95	1.73	12	102.6	6.5
6	B17 L9	225	1.96	1.73	13	102.5	4.9
7	C20 L3	225	1.95	1.73	13	102.1	5.7
8	C20 L4	225	1.99	1.77	13	104.6	4.1
9	C20 L5	225	1.99	1.76	13	104.1	3.6
10	D20 L10	225	1.91	1.69	13	99.8	7.4
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.69	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 20-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/83
Date of Issue 21 October 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/83

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	19/10/2022
DATE OF TEST	19/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	20/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
117950	SRD A17 L10	Black Ash/Sand	1.91	1.70	13	100.6	7.1
117951	SRD D20 L10	Black Ash/Sand	1.93	1.67	16	98.8	3.7
		Maximum Dry Density (Mg/m^3)		1.69		(Advised by client)	
		Particle Density (Mg/m^3)		2.40		(Advised by client)	

COMMENT / ANOMALIES

NAME S.J Hutchings (Director) SIGNED DATE 21-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/84
Date of Issue 21 October 2022
Page 1 of 9

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

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3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

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5 The results included within the report are representative of the samples submitted for analysis.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/84		
TEST LOCATION	Test 01 - H9 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	20-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4764	4722	4670	4719	0.00	0.00	0.0
4711	4676	4615	4667	-0.51	5.00	17.7
4750	4692	4654	4699	-0.20	0.00	0.0
4727	4679	4629	4678	-0.40	3.00	10.6
4696	4650	4592	4646	-0.73	6.00	21.2
4673	4633	4575	4627	-0.92	9.00	31.8
4655	4603	4565	4608	-1.11	12.00	42.4
4641	4589	4545	4592	-1.27	15.00	53.1
4592	4558	4496	4549	-1.70	18.00	63.7
4662	4651	4554	4622	-0.96	0.00	0.0
4635	4637	4532	4601	-1.17	3.00	10.6
4615	4612	4518	4582	-1.37	5.00	17.7
4603	4582	4488	4558	-1.61	9.00	31.8
4571	4575	4468	4538	-1.81	12.00	42.4
4548	4546	4442	4512	-2.07	15.00	53.1
4504	4520	4417	4480	-2.38	18.00	63.7
4604	4625	4523	4584	-1.35	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

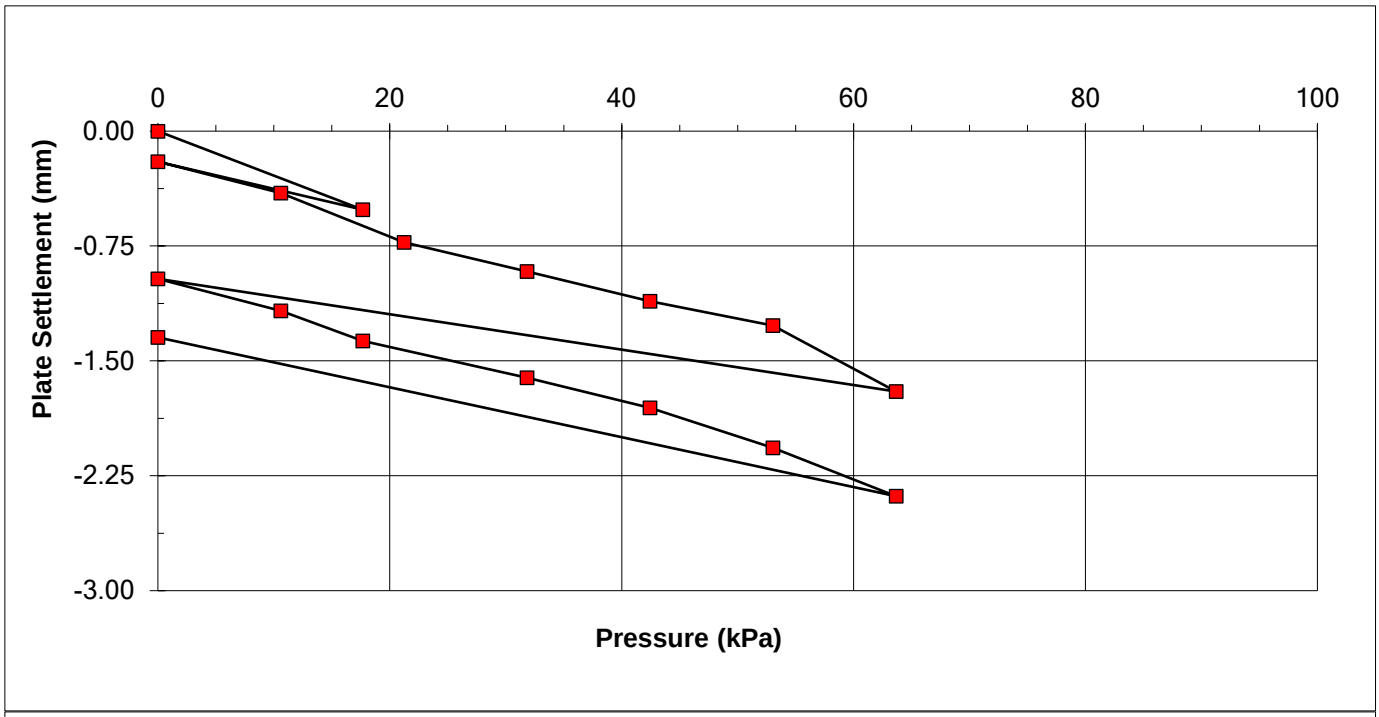
DATE 21-Oct-22

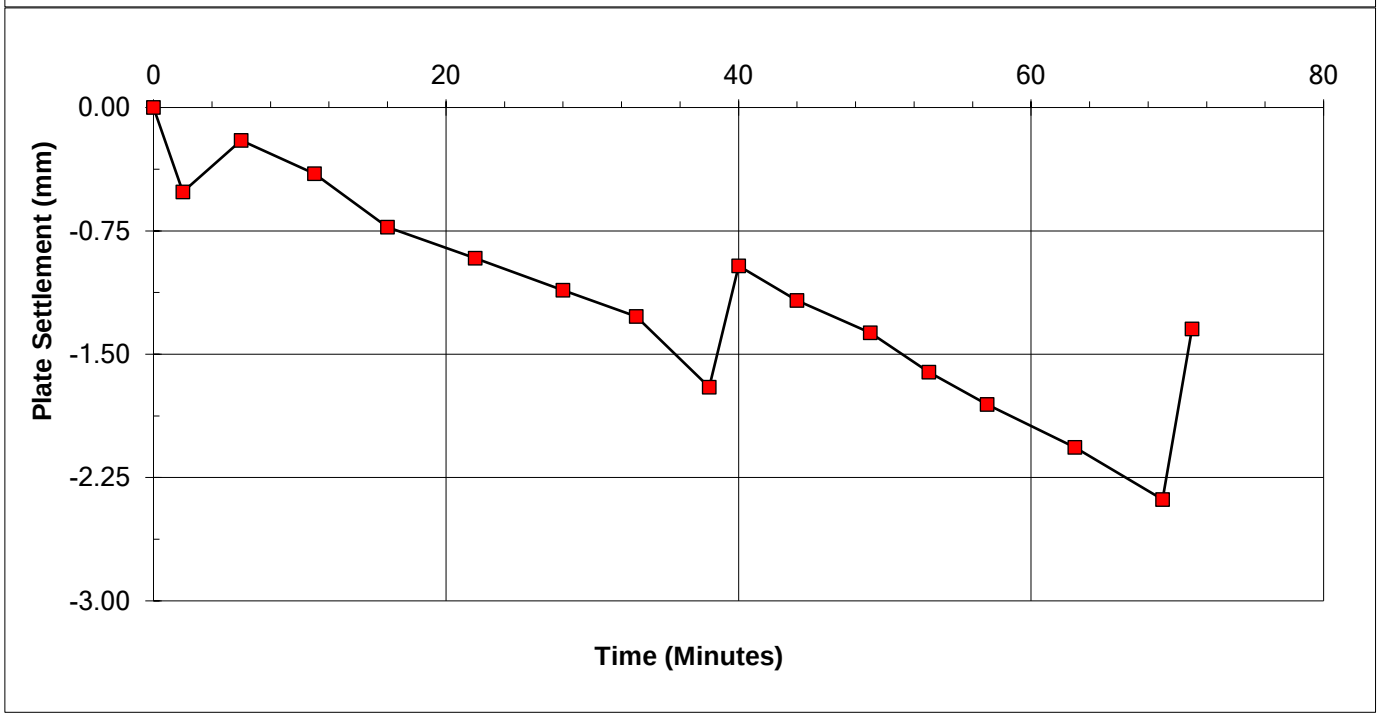
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 21-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/84		
TEST LOCATION	Test 02 - H7 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	20-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4766	4809	4679	4751	0.00	0.00	0.0
4708	4762	4525	4665	-0.86	3.00	10.6
4724	4780	4542	4682	-0.69	0.00	0.0
4697	4757	4519	4658	-0.94	3.00	10.6
4675	4732	4503	4637	-1.15	6.00	21.2
4646	4700	4481	4609	-1.42	9.00	31.8
4620	4687	4468	4592	-1.60	12.00	42.4
4607	4661	4441	4570	-1.82	15.00	53.1
4570	4643	4395	4536	-2.15	18.00	63.7
4636	4683	4455	4591	-1.60	0.00	0.0
4609	4660	4431	4567	-1.85	3.00	10.6
4594	4643	4418	4552	-2.00	6.00	21.2
4576	4616	4393	4528	-2.23	9.00	31.8
4547	4590	4379	4505	-2.46	12.00	42.4
4534	4574	4348	4485	-2.66	15.00	53.1
4516	4539	4323	4459	-2.92	18.00	63.7
4581	4640	4337	4519	-2.32	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	49	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	61	kPa
Modulus of subgrade reaction (k) =	49	MPa/m
Equivalent 762 mm plate reaction =	39	MPa/m
Equivalent CBR =	5.5	%
Surface Stiffness Modulus (E) =	53	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 21-Oct-22

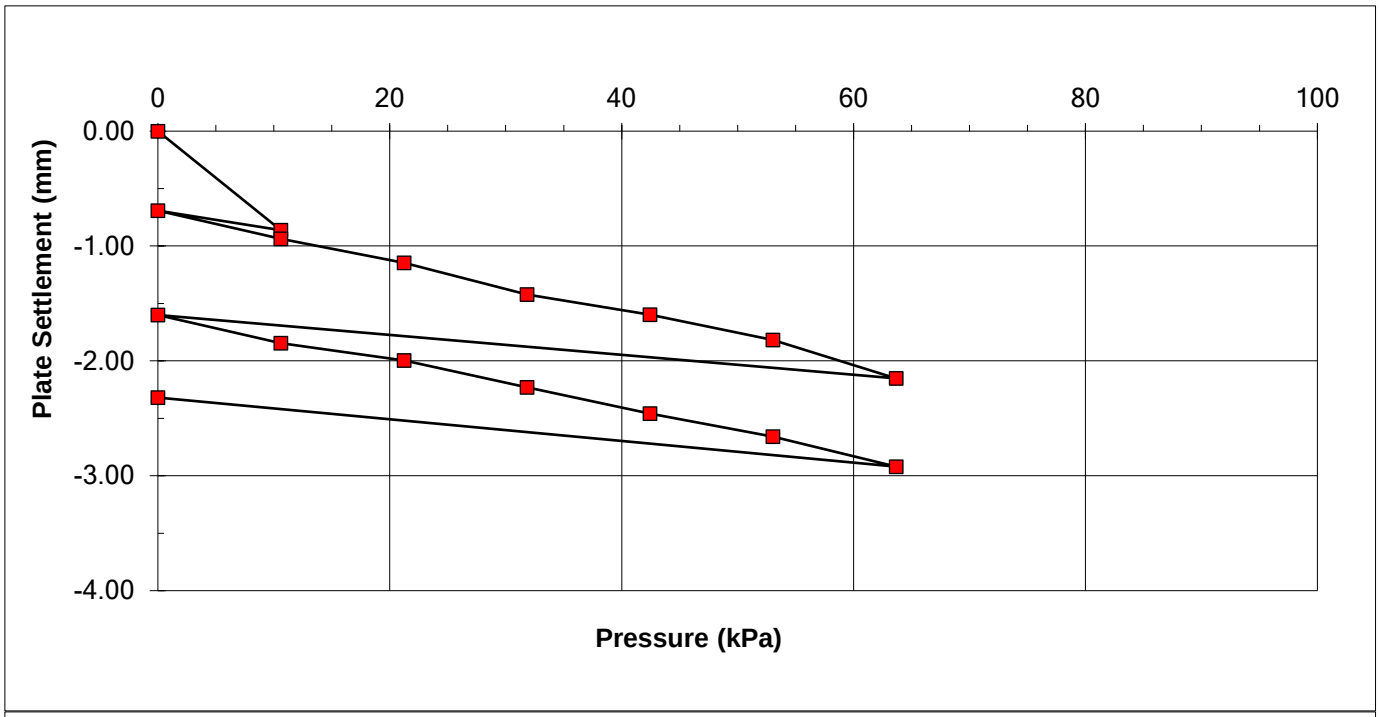
MURRAY RIX

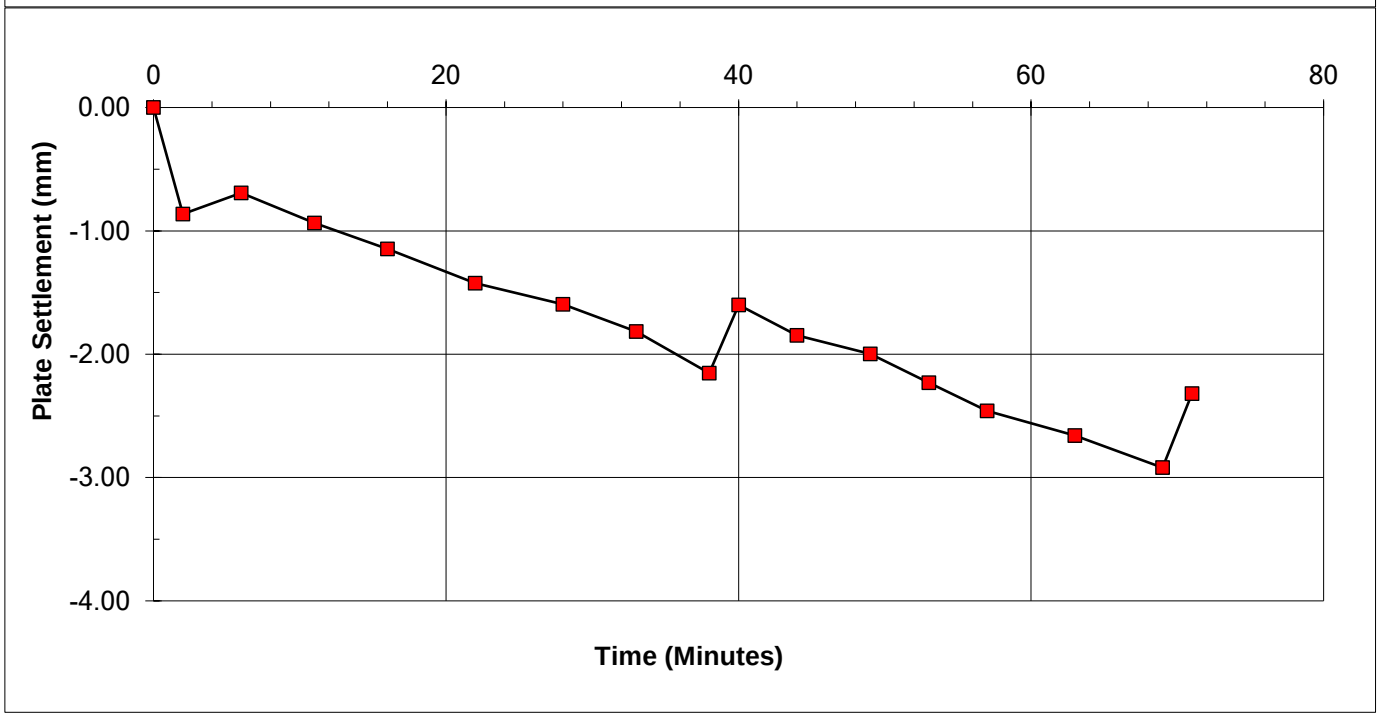
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 21-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/84		
TEST LOCATION	Test 03 - H11 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	20-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4740	4751	4814	4768	0.00	0.00	0.0
4680	4709	4758	4716	-0.53	6.00	21.2
4727	4736	4795	4753	-0.16	0.00	0.0
4694	4726	4778	4733	-0.36	3.00	10.6
4663	4708	4752	4708	-0.61	6.00	21.2
4632	4678	4731	4680	-0.88	9.00	31.8
4621	4665	4716	4667	-1.01	12.00	42.4
4603	4647	4699	4650	-1.19	15.00	53.1
4581	4621	4670	4624	-1.44	17.00	60.1
4627	4683	4645	4652	-1.17	0.00	0.0
4589	4658	4620	4622	-1.46	4.00	14.1
4572	4641	4589	4601	-1.68	7.00	24.8
4539	4618	4566	4574	-1.94	10.00	35.4
4512	4591	4536	4546	-2.22	13.00	46.0
4480	4555	4509	4515	-2.54	15.00	53.1
4436	4543	4481	4487	-2.82	18.00	63.7
4556	4656	4575	4596	-1.73	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	59	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.3	%
Surface Stiffness Modulus (E) =	51	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	50	kPa
Modulus of subgrade reaction (k) =	40	MPa/m
Equivalent 762 mm plate reaction =	32	MPa/m
Equivalent CBR =	4.0	%
Surface Stiffness Modulus (E) =	43	MN/m^2

Surface Stiffness Modulus Ratio =	0.8

DATE 21-Oct-22

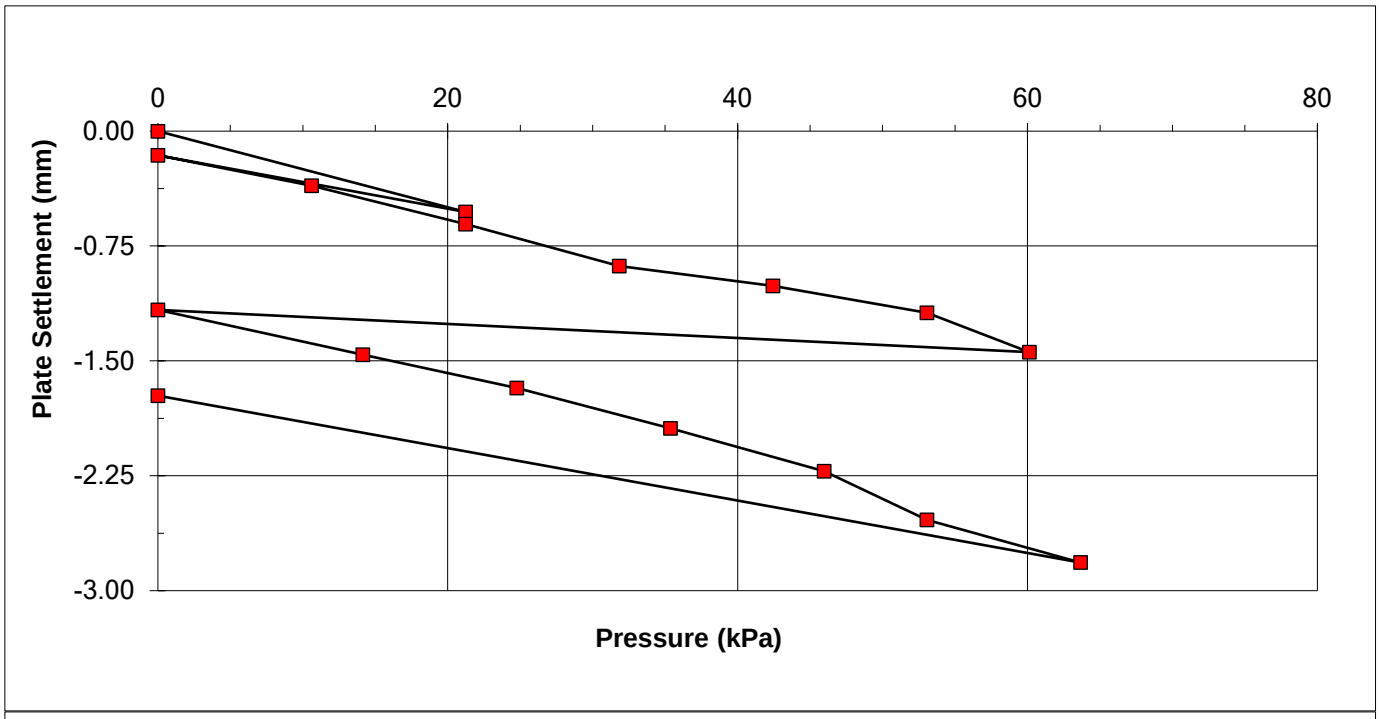
MURRAY RIX

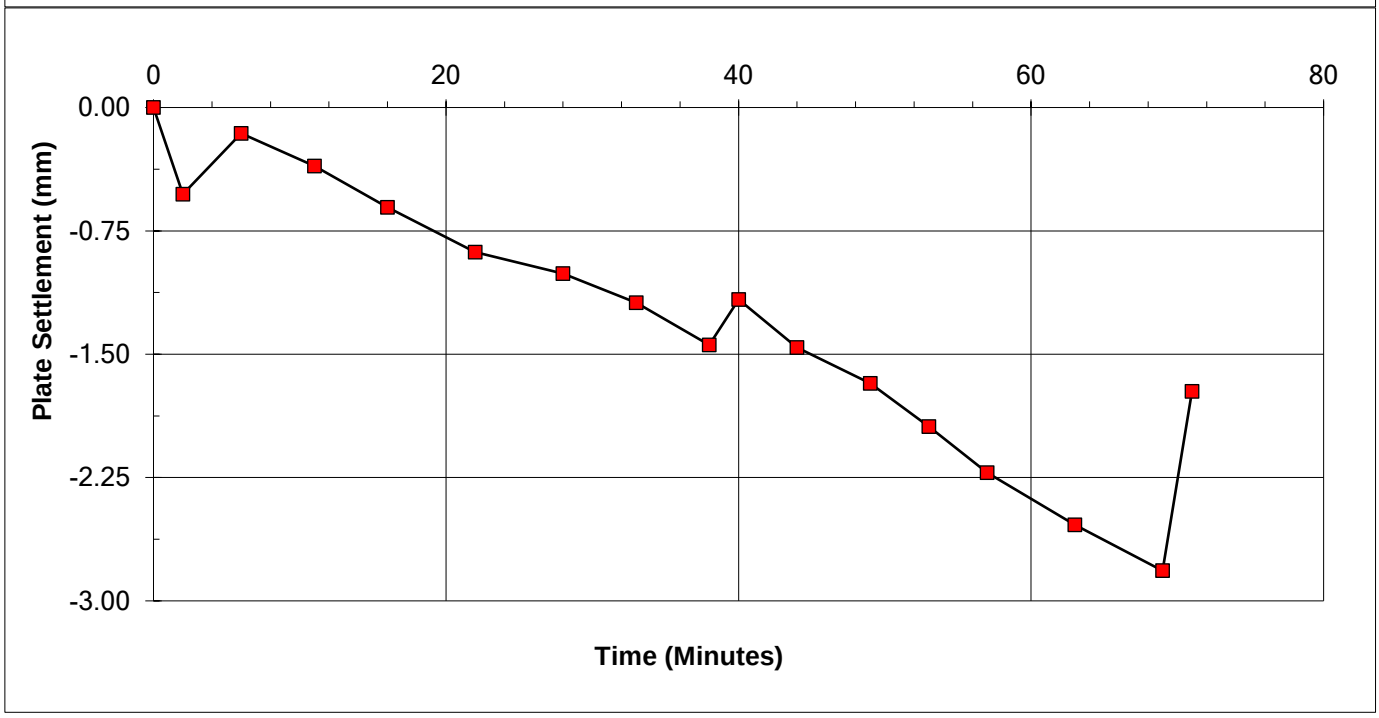
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 21-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/84		
TEST LOCATION	Test 04 - A19 L8	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	20-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4790	4804	4821	4805	0.00	0.00	0.0
4631	4662	4688	4660	-1.45	6.00	21.2
4656	4670	4712	4679	-1.26	0.00	0.0
4627	4642	4685	4651	-1.54	5.00	17.7
4596	4611	4661	4623	-1.82	9.00	31.8
4565	4577	4636	4593	-2.12	14.00	49.5
4534	4548	4611	4564	-2.41	18.00	63.7
4504	4517	4589	4537	-2.68	24.00	84.9
4466	4481	4553	4500	-3.05	28.00	99.0
4561	4558	4618	4579	-2.26	0.00	0.0
4534	4532	4597	4554	-2.51	7.00	24.8
4505	4499	4568	4524	-2.81	11.00	38.9
4475	4469	4543	4496	-3.09	15.00	53.1
4446	4441	4519	4469	-3.36	21.00	74.3
4414	4409	4498	4440	-3.65	29.00	102.6
4373	4368	4463	4401	-4.04	36.00	127.3
4479	4471	4558	4503	-3.02	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	71	kPa
Modulus of subgrade reaction (k) =	57	MPa/m
Equivalent 762 mm plate reaction =	46	MPa/m
Equivalent CBR =	7.3	%
Surface Stiffness Modulus (E) =	63	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	89	kPa
Modulus of subgrade reaction (k) =	71	MPa/m
Equivalent 762 mm plate reaction =	57	MPa/m
Equivalent CBR =	10.7	%
Surface Stiffness Modulus (E) =	80	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 21-Oct-22

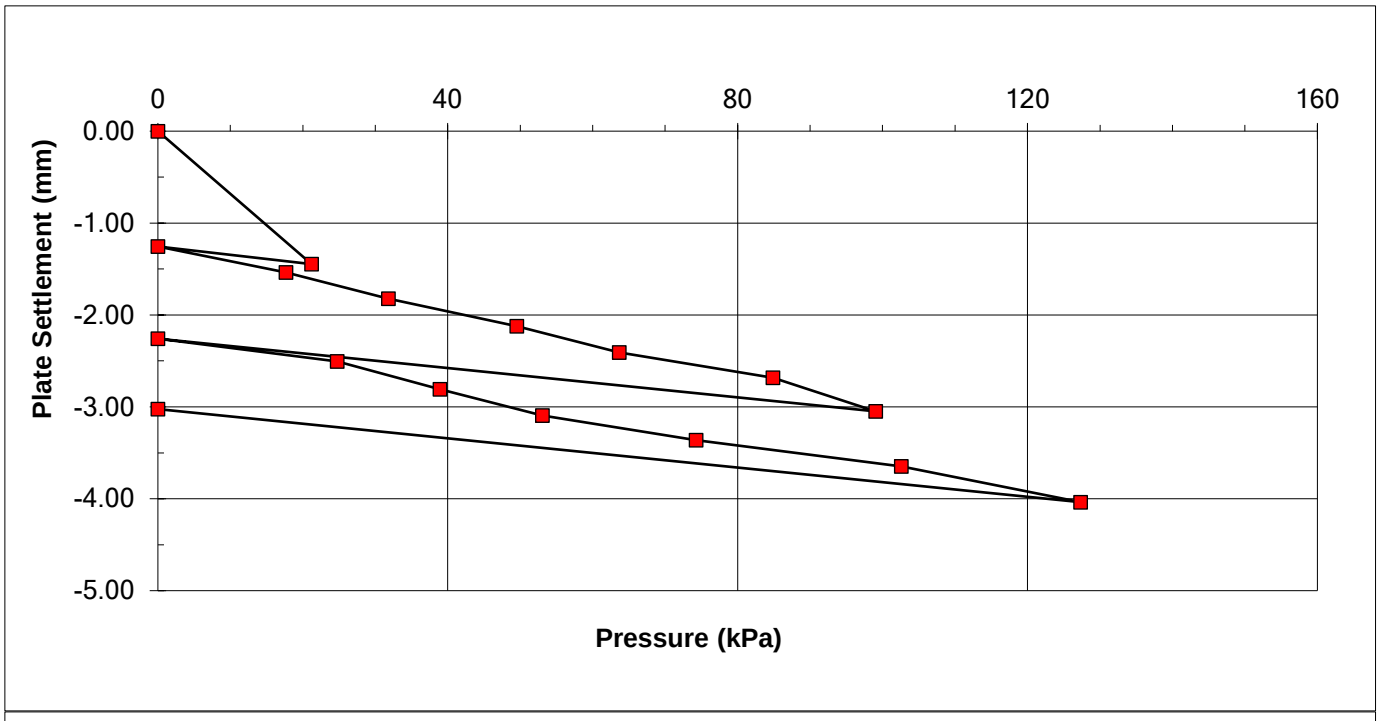
MURRAY RIX

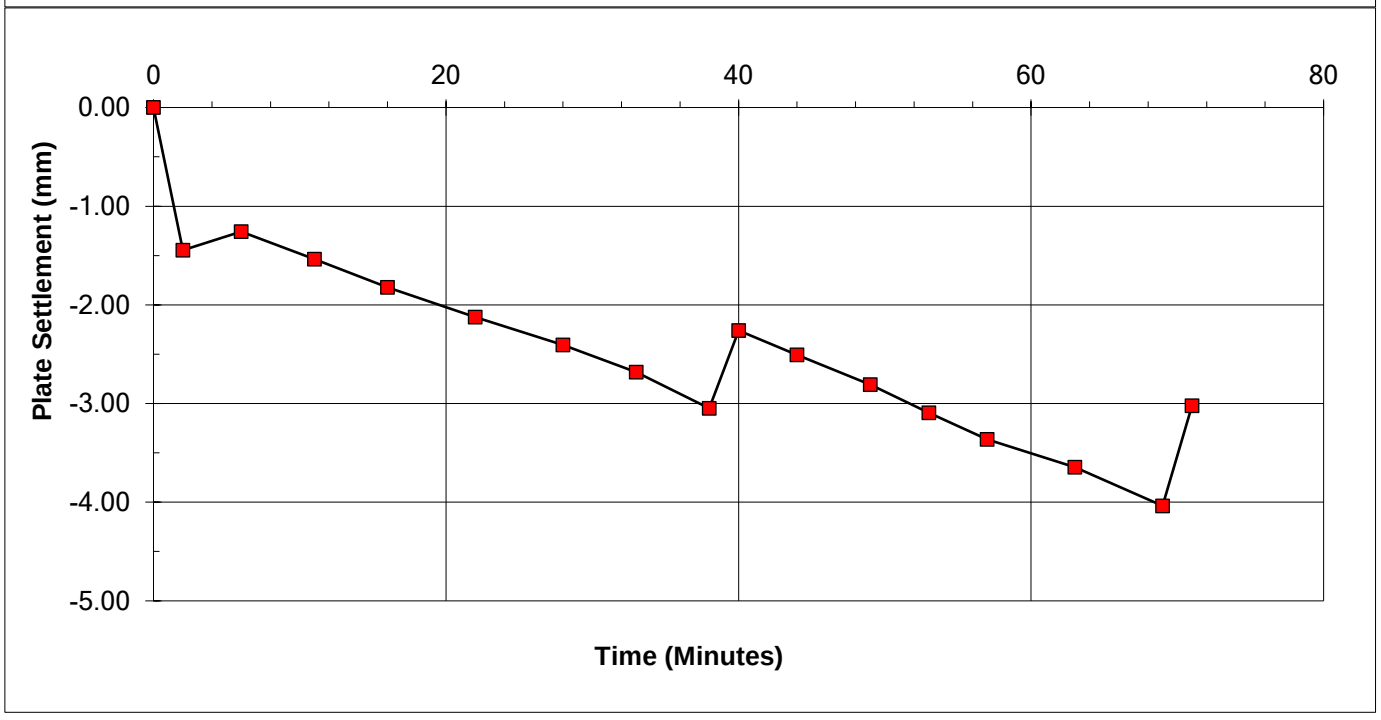
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 21-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/85
Date of Issue 24 October 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	21-Oct-22	**JOB NUMBER**	MRN 4454/85
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D16 L9	225	1.92	1.65	16	99.6	0.3
2	D16 L10	225	1.92	1.67	15	100.6	0.8
3	D16 L11	225	1.90	1.67	14	100.4	2.6
4	D17 L9	225	1.91	1.65	16	99.3	0.3
5	D17 L10	225	1.89	1.63	16	98.0	1.8
6	D17 L11	225	1.89	1.64	15	99.0	2.6
7	E16 L1	225	1.90	1.65	15	99.5	1.7
8	E16 L2	225	1.85	1.61	15	96.9	4.3
9	E16 L3	225	1.85	1.61	15	96.9	4.3
10	E16 L4	225	1.88	1.63	16	98.2	2.1
11	E16 L5	225	1.84	1.60	15	96.2	5.1
12	E17 L2	225	1.84	1.61	14	96.8	5.4
13	E17 L3	225	1.89	1.62	17	97.5	1.3
14	E17 L4	225	1.88	1.60	18	96.1	0.7
15	E17 L5	225	1.90	1.62	17	97.9	0.3
16	E17 L6	225	1.91	1.64	16	98.8	0.1
17	E17 L7	225	1.89	1.61	17	97.2	0.7
18	B19 L11	225	1.93	1.67	15	100.6	0.2
19	E18 L2	225	1.91	1.64	16	99.0	0.0
20	E18 L3	225	1.88	1.64	15	99.0	3.0
				Maximum Dry Density (Mg/m3)	1.66	(Advised by client)	
				Particle Density (Mg/m3)	2.25	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 24-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/85

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	21/10/2022
DATE OF TEST	21/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	22/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
118067	SRD D16 L11	Black Ash/Sand	1.92	2.11	9.9	105.2	5.1
118068	SRD E16 L6	Black Ash/Sand	1.87	1.80	15	98.0	3.3
118069	SRD E17 L11	Black Ash/Sand	1.86	1.60	16	96.6	3.1
		Maximum Dry Density (Mg/m^3)		1.66		(Advised by client)	
		Particle Density (Mg/m^3)		2.25		(Advised by client)	

COMMENT / ANOMALIES

NAME S.J Hutchings (Director) SIGNED DATE 24-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/86
Date of Issue 27 October 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	25-Oct-22	**JOB NUMBER**	MRN 4454/86
MATERIAL	Ash		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	H15 L1	225	1.96	1.69	16	94.5	1.5
2	H14 L1	225	1.96	1.71	14	95.5	2.6
3	I14 L1	225	1.93	1.72	12	96.3	6.5
4	I15 L1	225	1.98	1.75	13	97.6	2.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.79	(Advised by client)	
				Particle Density (Mg/m3)	2.35	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 27-Oct-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/86		
TEST LOCATION	Test 01 - G20 L5	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	25-Oct-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Yellow Gravel	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4661	4745	4589	4665	0.00	0.00	0.0
4585	4645	4446	4559	-1.06	10.00	35.4
4595	4654	4451	4567	-0.98	0.00	0.0
4560	4630	4435	4542	-1.23	12.00	42.4
4500	4585	4389	4491	-1.74	20.00	70.7
4444	4551	4362	4452	-2.13	28.00	99.0
4398	4520	4325	4414	-2.51	34.00	120.3
4355	4484	4278	4372	-2.93	48.00	169.8
4313	4446	4240	4333	-3.32	60.00	212.2
4385	4498	4352	4412	-2.53	0.00	0.0
4360	4450	4312	4374	-2.91	8.00	28.3
4340	4420	4299	4353	-3.12	11.00	38.9
4310	4403	4269	4327	-3.38	16.00	56.6
4270	4376	4238	4295	-3.70	24.00	84.9
4223	4328	4197	4249	-4.16	42.00	148.5
4178	4265	4153	4199	-4.66	70.00	247.6
4235	4312	4239	4262	-4.03	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	105	kPa
Modulus of subgrade reaction (k) =	84	MPa/m
Equivalent 762 mm plate reaction =	68	MPa/m
Equivalent CBR =	14.3	%
Surface Stiffness Modulus (E) =	97	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	96	kPa
Modulus of subgrade reaction (k) =	77	MPa/m
Equivalent 762 mm plate reaction =	62	MPa/m
Equivalent CBR =	12.3	%
Surface Stiffness Modulus (E) =	88	MN/m^2

Surface Stiffness Modulus Ratio =	0.9

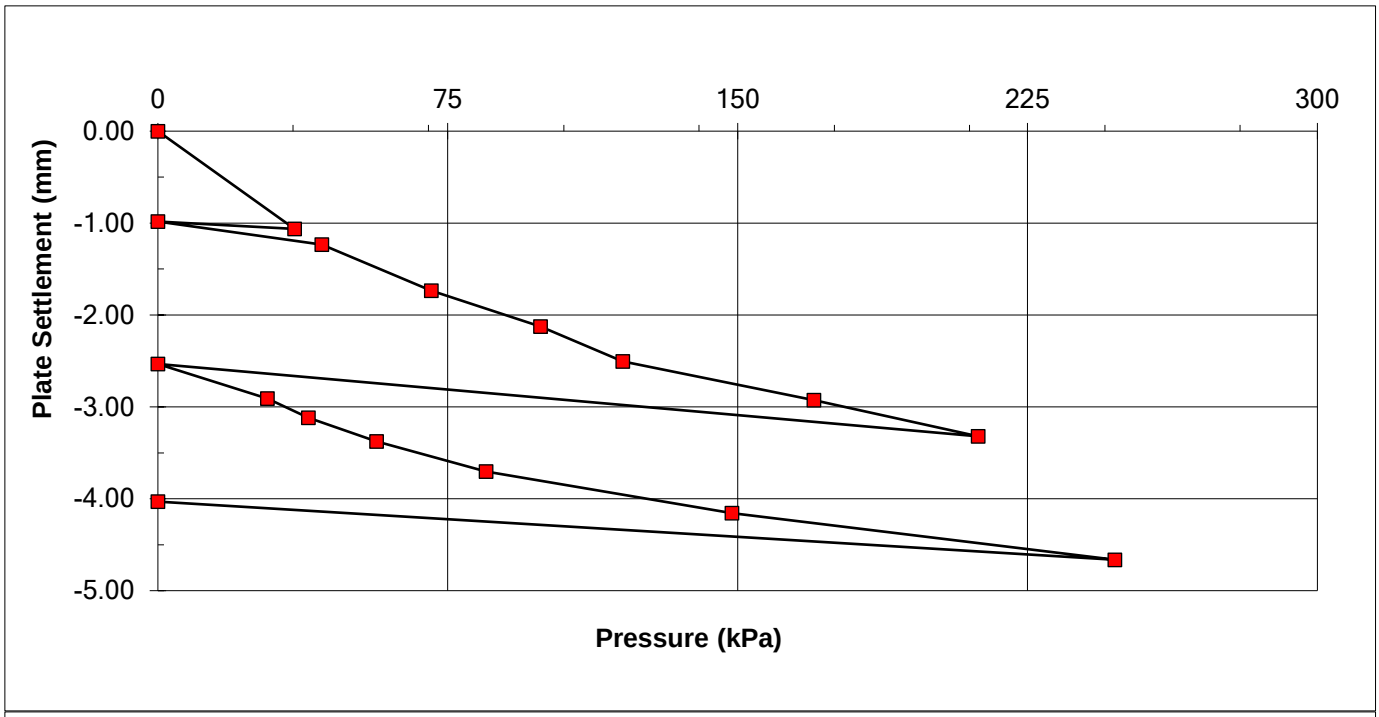
DATE 27-Oct-22

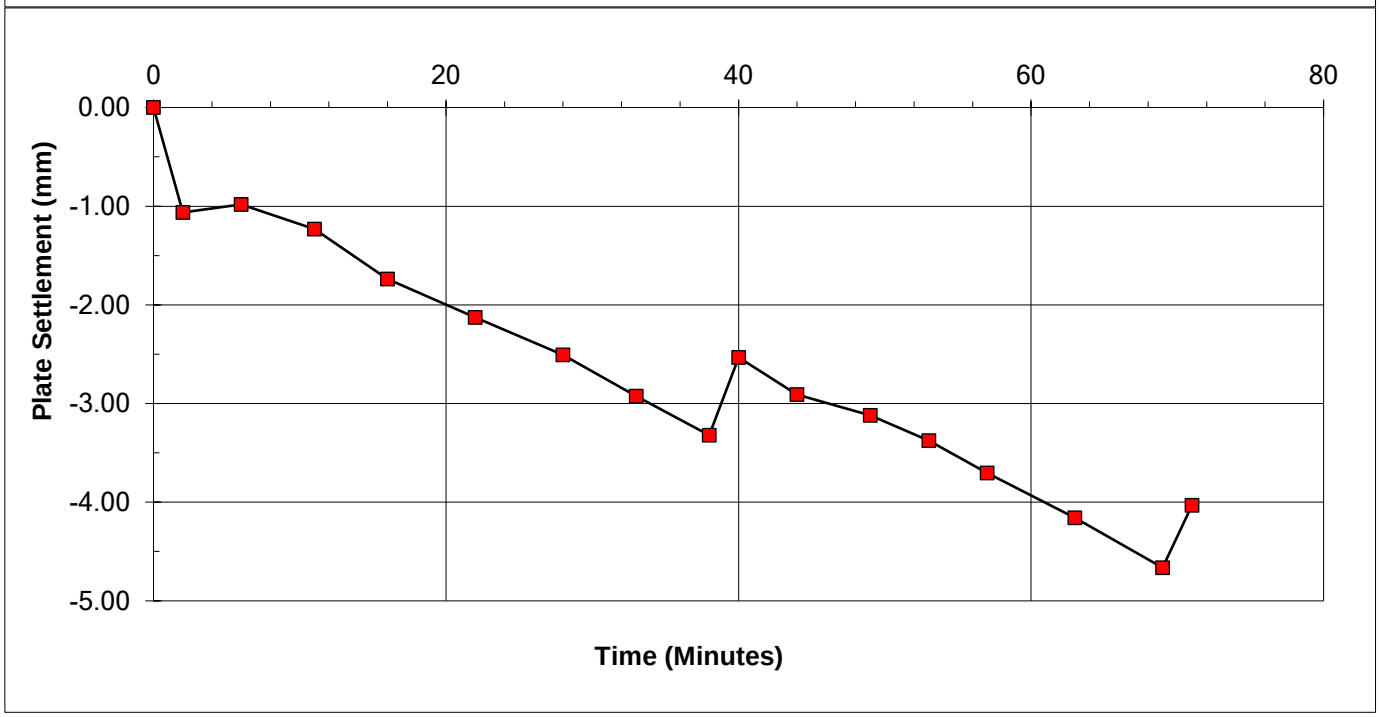
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 27-Oct-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/86

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	25/10/2022
DATE OF TEST	25/10/2022	SAMPLED BY	Murray Rix
DATE TESTED	26/10/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
118378	SRD D18 L10	Ash/Gravel	2.00	1.74	15	97.2	-0.1
118379	SRD I15 L1	Ash/Gravel	1.99	1.73	15	96.6	0.4
		Maximum Dry Density (Mg/m^3)		1.79		(Advised by client)	
		Particle Density (Mg/m^3)		2.35		(Advised by client)	

COMMENT / ANOMALIES

NAME S.J Hutchings (Director) SIGNED DATE 27-Oct-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/88
Date of Issue 08 November 2022
Page 1 of 17

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

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5 The results included within the report are representative of the samples submitted for analysis.

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

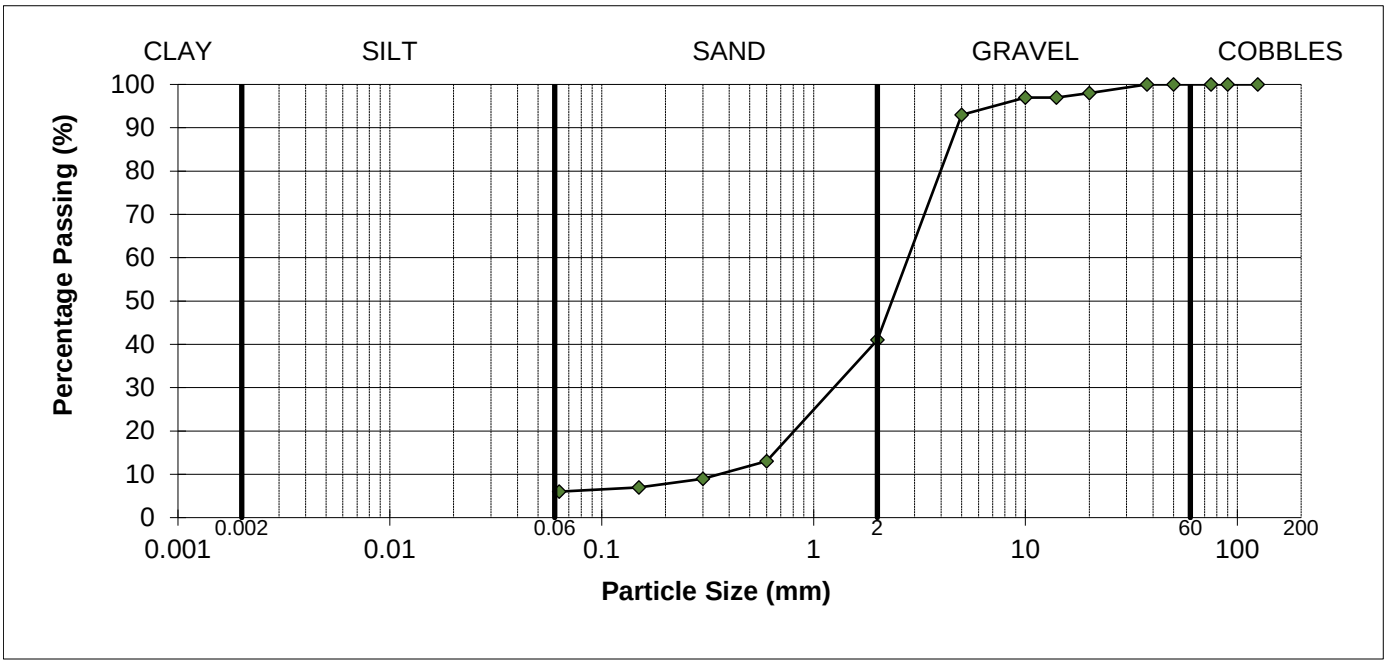
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-tp-E13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117659	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP E13

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	97	
90	100		5	93	
75	100		2	41	
50	100		0.6	13	
37.5	100		0.3	9	
20	98		0.15	7	
14	97		0.063	6	



REMARKS
As received moisture content = 7.6%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

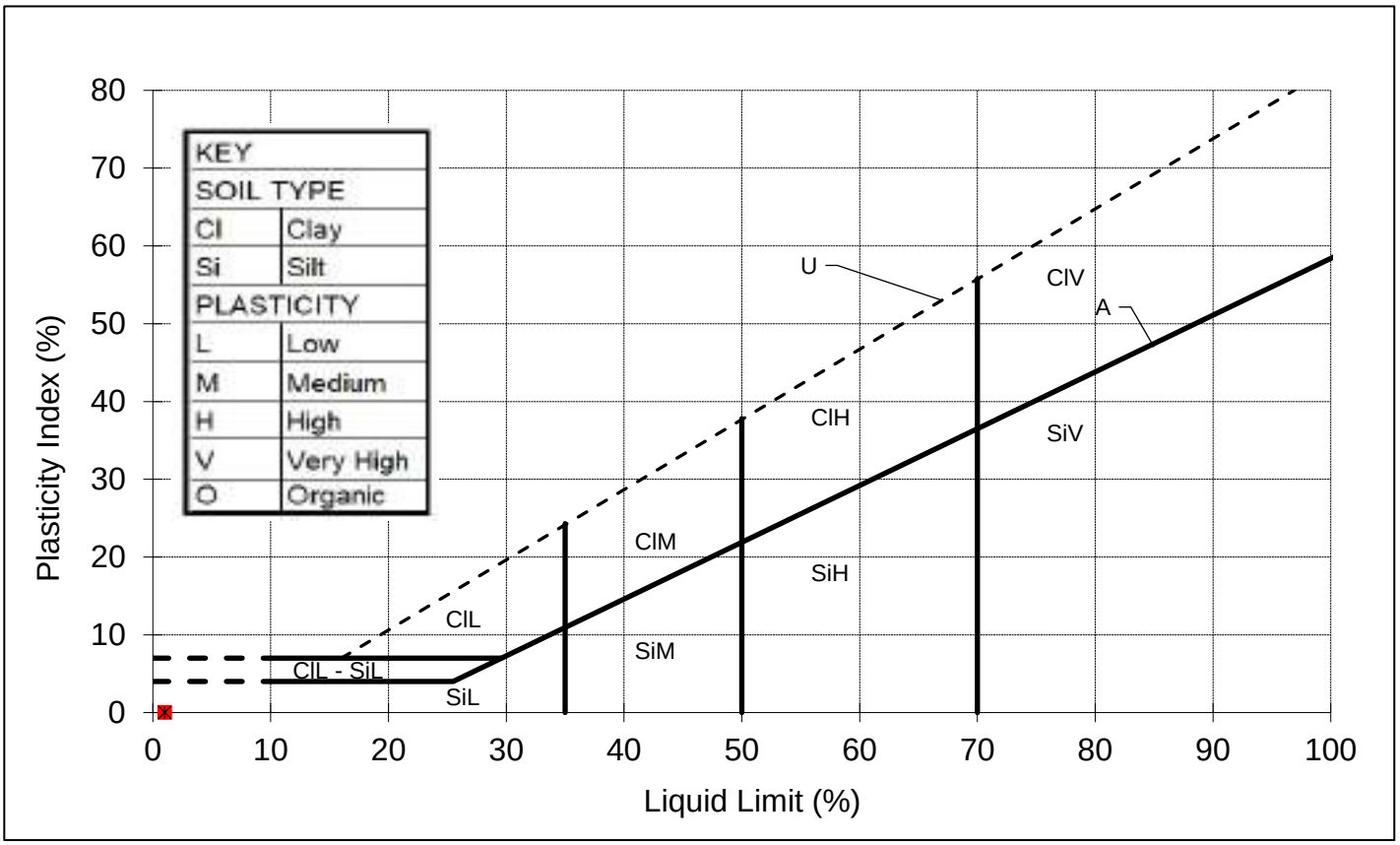
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-tp-E13-1m	DATE SAMPLED	06-Oct-22
SAMPLE No.	117659	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP E13

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
7.6	N/A	Non Plastic	N/A	11



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 08-Nov-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

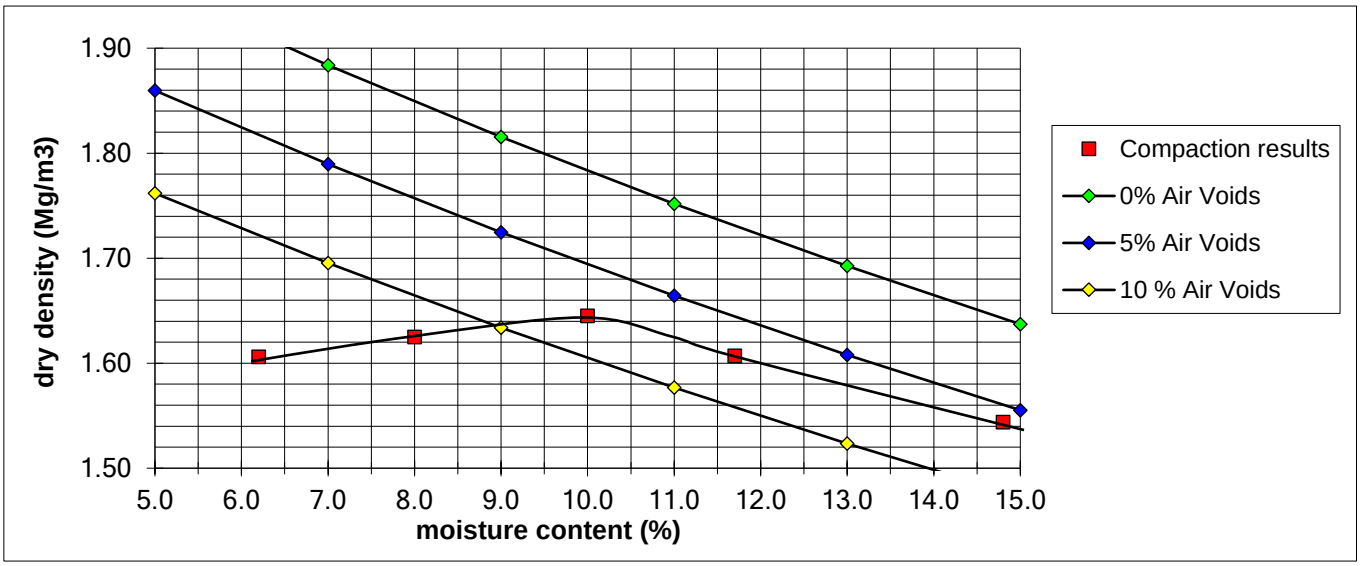
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-tp-E13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117659	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP E13
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	6.2	1.606
2	8.0	1.625
3	10.0	1.645
4	11.7	1.607
5	14.8	1.544
Optimum	10.0	
Maximum		1.64
Particle Density	2.17 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 0%
Percentage of material retained on 20mm sieve = 3%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

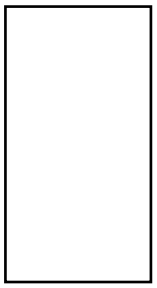
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-tp-E13-1m	DATE SAMPLED	06-Oct-22
LAB SAMPLE No	117659	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - TP E13

SPECIMEN LENGTH	N/A	mm
SPECIMEN DIAMETER	N/A	mm
MOISTURE CONTENT OF SAMPLE	8.7	%
BULK DENSITY	1.60	Mg/m3
DRY DENSITY	1.47	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	N/A	%/min
RUBBER MEMBRANE THICKNESS	N/A	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
N/A	N/A	N/A	N/A	N/A

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer, Sample did not hold together for test after re-compaction.

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

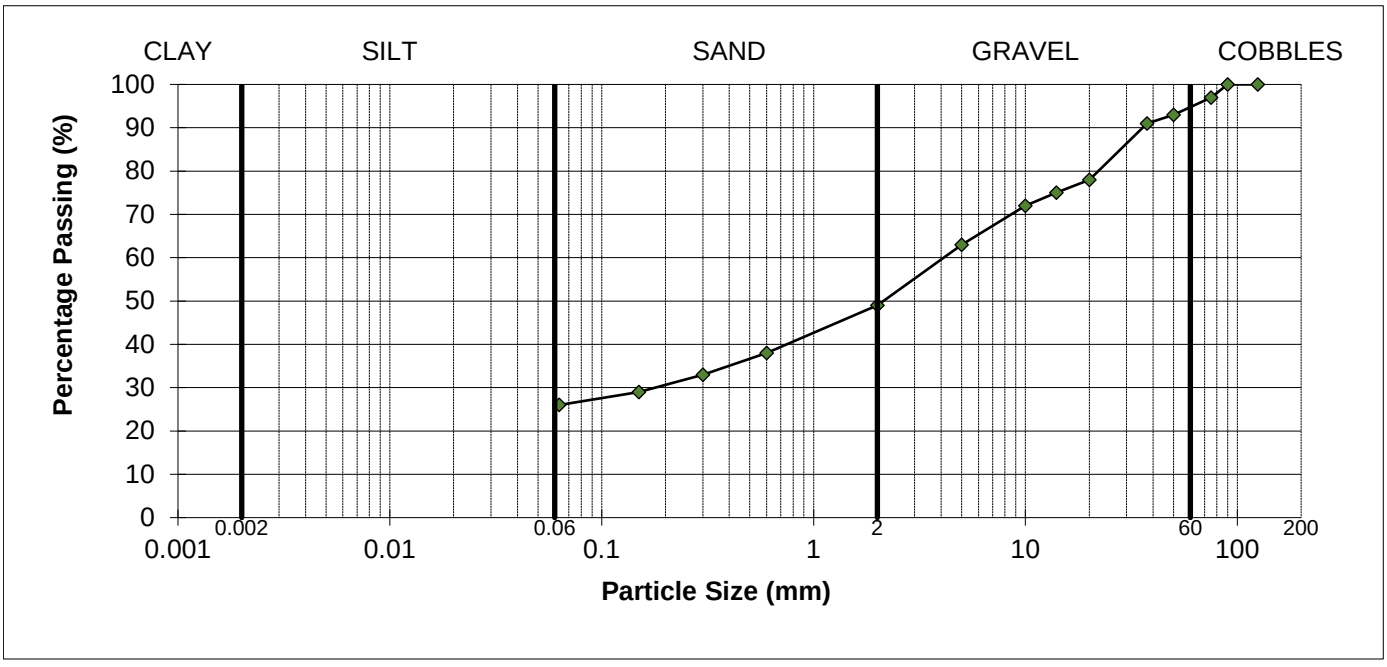
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G13	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117660	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G13

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	72	
90	100		5	63	
75	97		2	49	
50	93		0.6	38	
37.5	91		0.3	33	
20	78		0.15	29	
14	75		0.063	26	



REMARKS
As received moisture content = 22%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

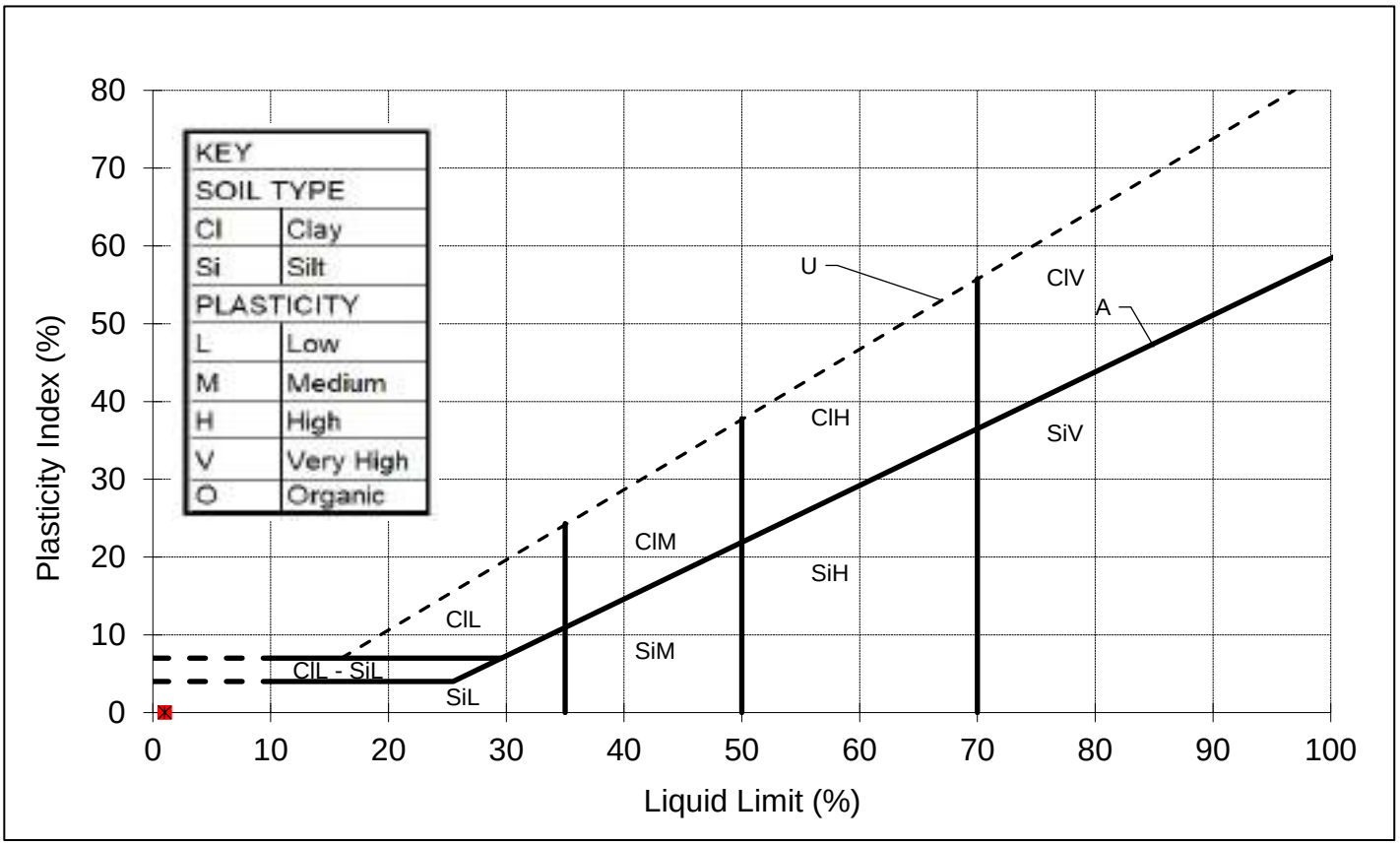
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G13	DATE SAMPLED	11-Oct-22
SAMPLE No.	117660	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G13

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22	N/A	Non Plastic	N/A	36



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 08-Nov-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

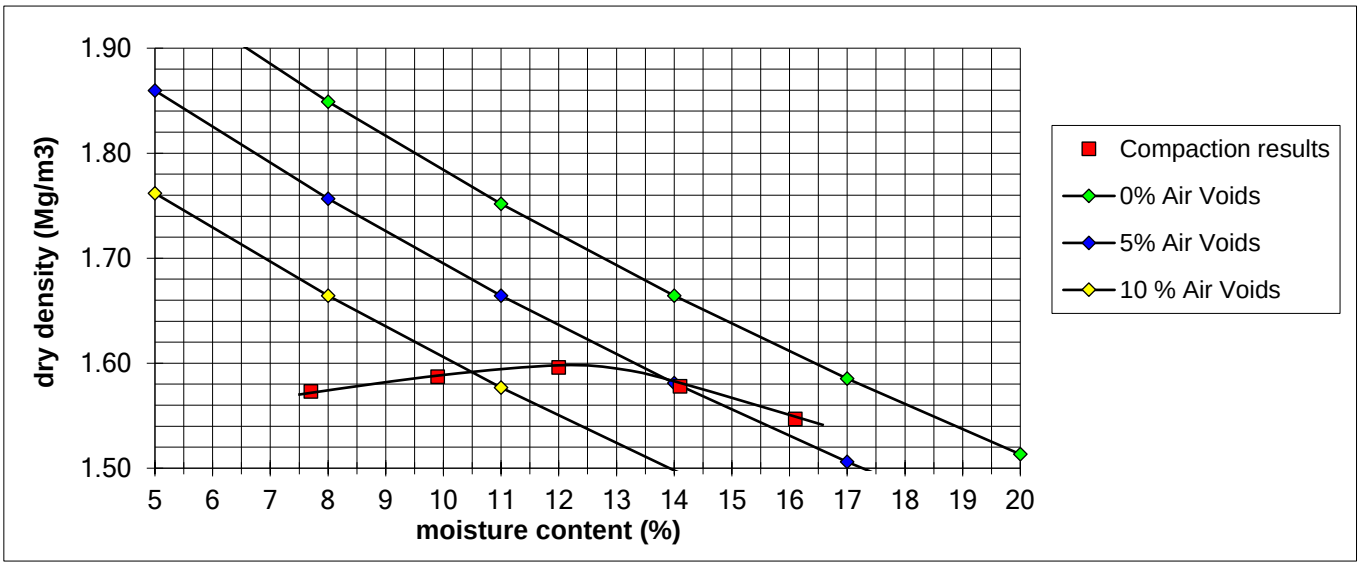
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G13	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117660	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G13
PRE TREATMENT	Air Dried/Separate Batches

Point Number	Moisture Content (%)	Dry Density (Mg/m3)
1	7.7	1.573
2	9.9	1.587
3	12.0	1.596
4	14.1	1.578
5	16.1	1.547
Optimum	12.0	
Maximum		1.60
Particle Density	2.17 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 10%
Percentage of material retained on 20mm sieve = 20%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

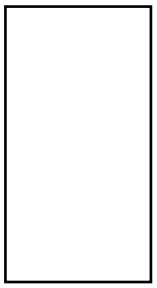
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G13	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117660	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G13

SPECIMEN LENGTH	203	mm
SPECIMEN DIAMETER	99	mm
MOISTURE CONTENT OF SAMPLE	24.5	%
BULK DENSITY	1.65	Mg/m3
DRY DENSITY	1.32	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.53	111.9	56

REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 08-Nov-22

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

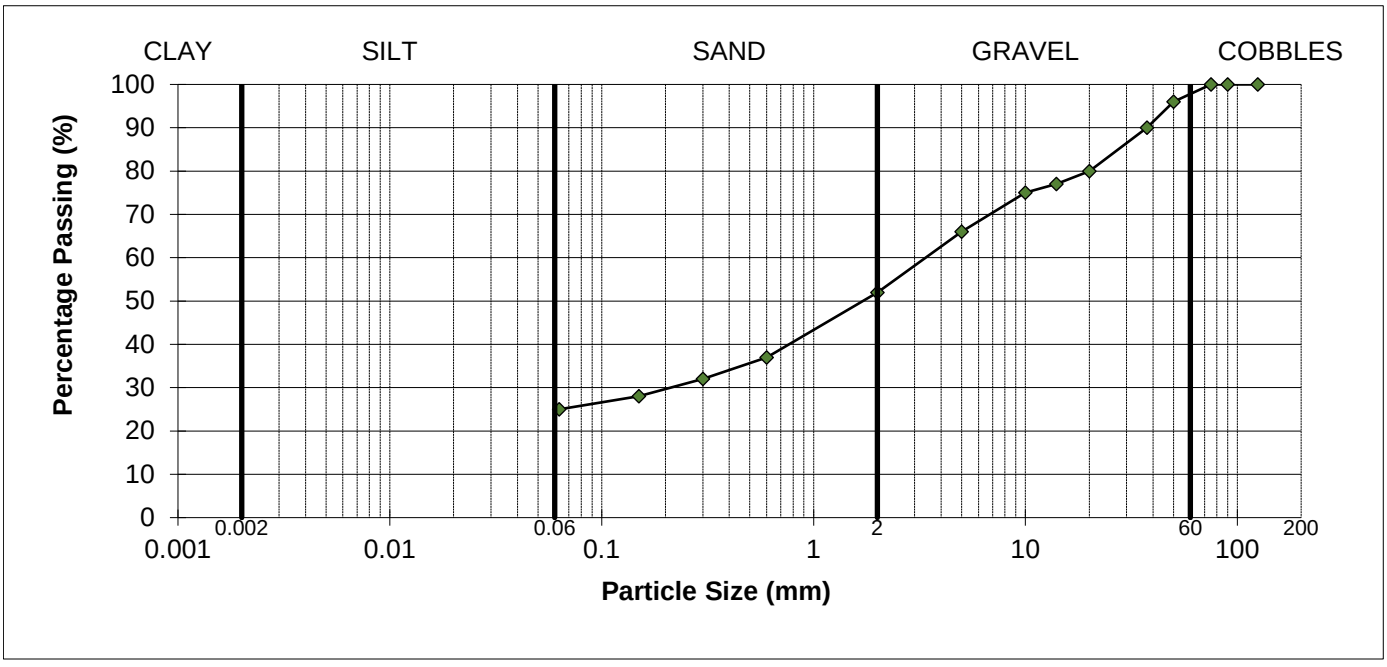
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G14	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117661	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G14

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	75	
90	100		5	66	
75	100		2	52	
50	96		0.6	37	
37.5	90		0.3	32	
20	80		0.15	28	
14	77		0.063	25	



REMARKS
As received moisture content = 18%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

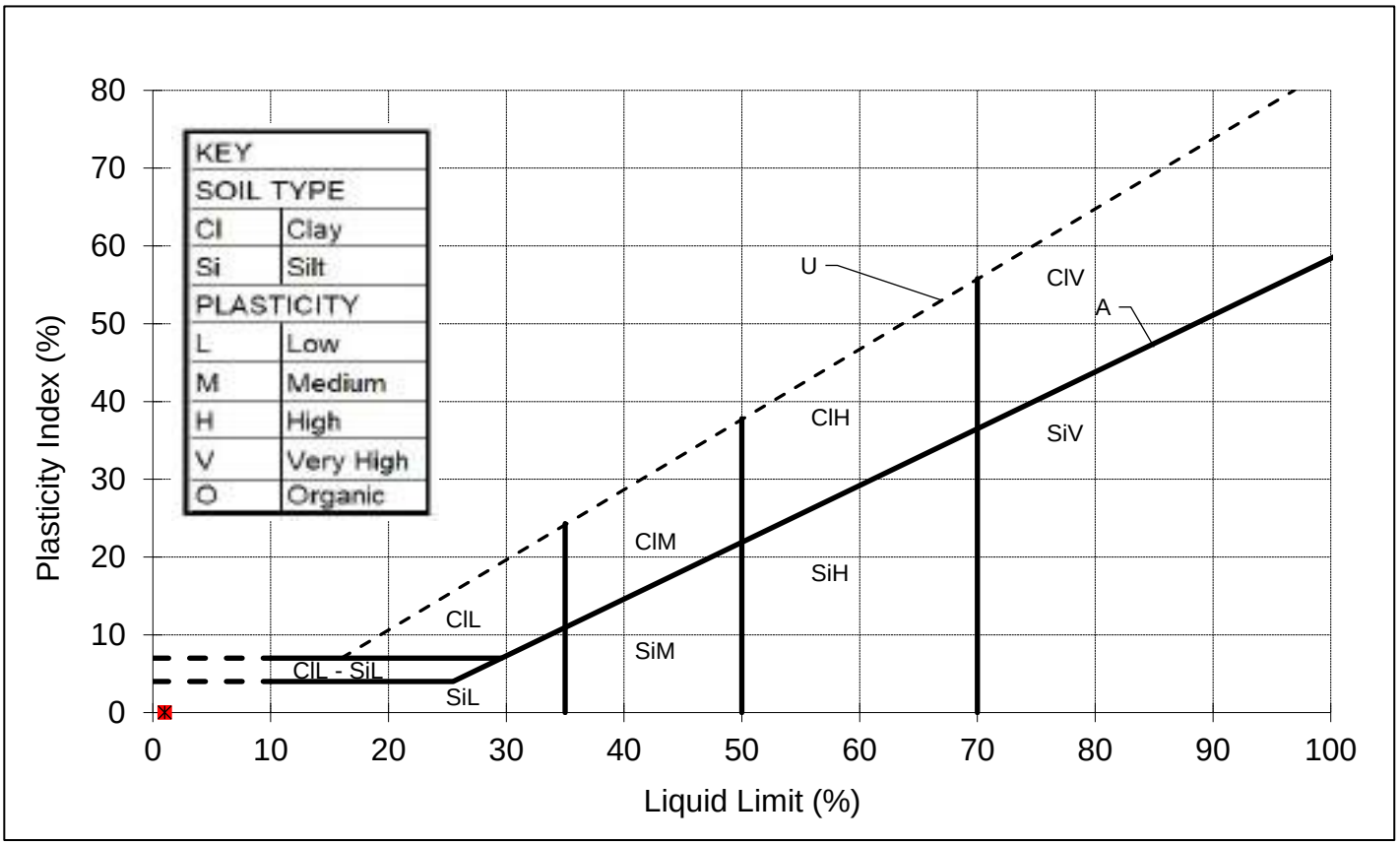
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G14	DATE SAMPLED	11-Oct-22
SAMPLE No.	117661	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G14

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18	N/A	Non Plastic	N/A	34



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 08-Nov-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

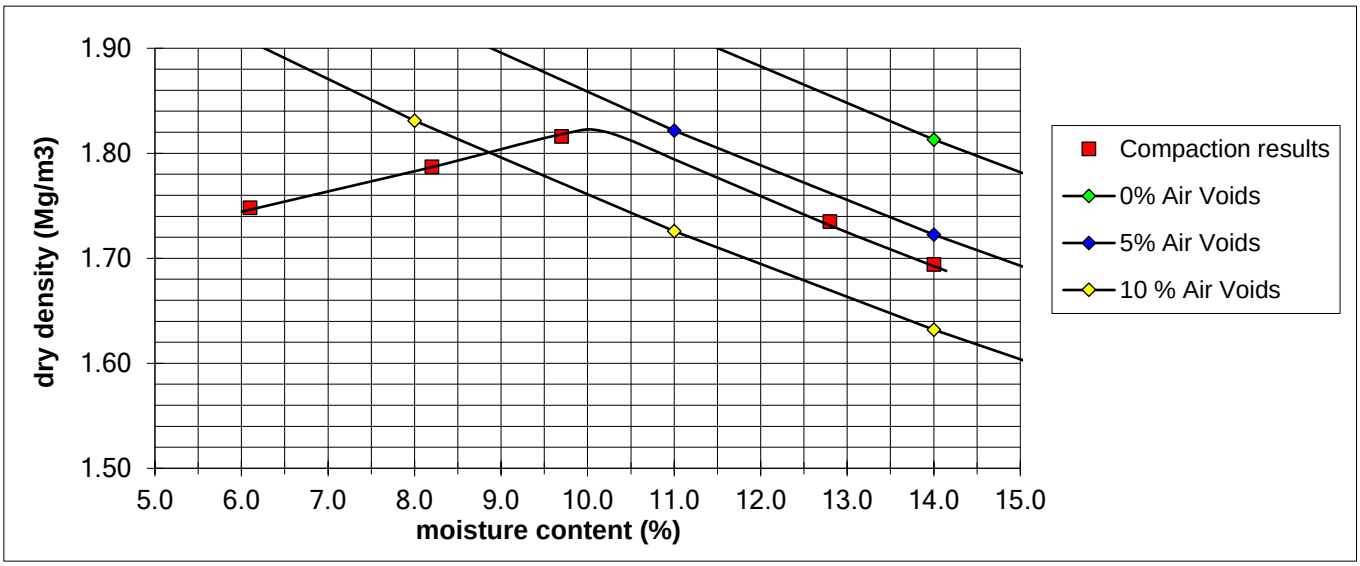
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G14	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117661	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G14
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		6.1	1.748
2		8.2	1.787
3		9.7	1.816
4		12.8	1.735
5		14.0	1.694
	Optimum	10.0	
	Maximum		1.82
	Particle Density	2.43 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 10%
Percentage of material retained on 20mm sieve = 20%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

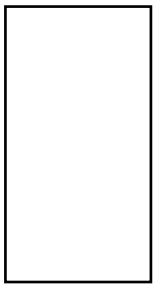
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-1m-G14	DATE SAMPLED	11-Oct-22
LAB SAMPLE No	117661	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - G14

SPECIMEN LENGTH	195	mm
SPECIMEN DIAMETER	99	mm
MOISTURE CONTENT OF SAMPLE	18.5	%
BULK DENSITY	1.84	Mg/m3
DRY DENSITY	1.55	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.53	48.5	24

REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager)

DATE 08-Nov-22

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

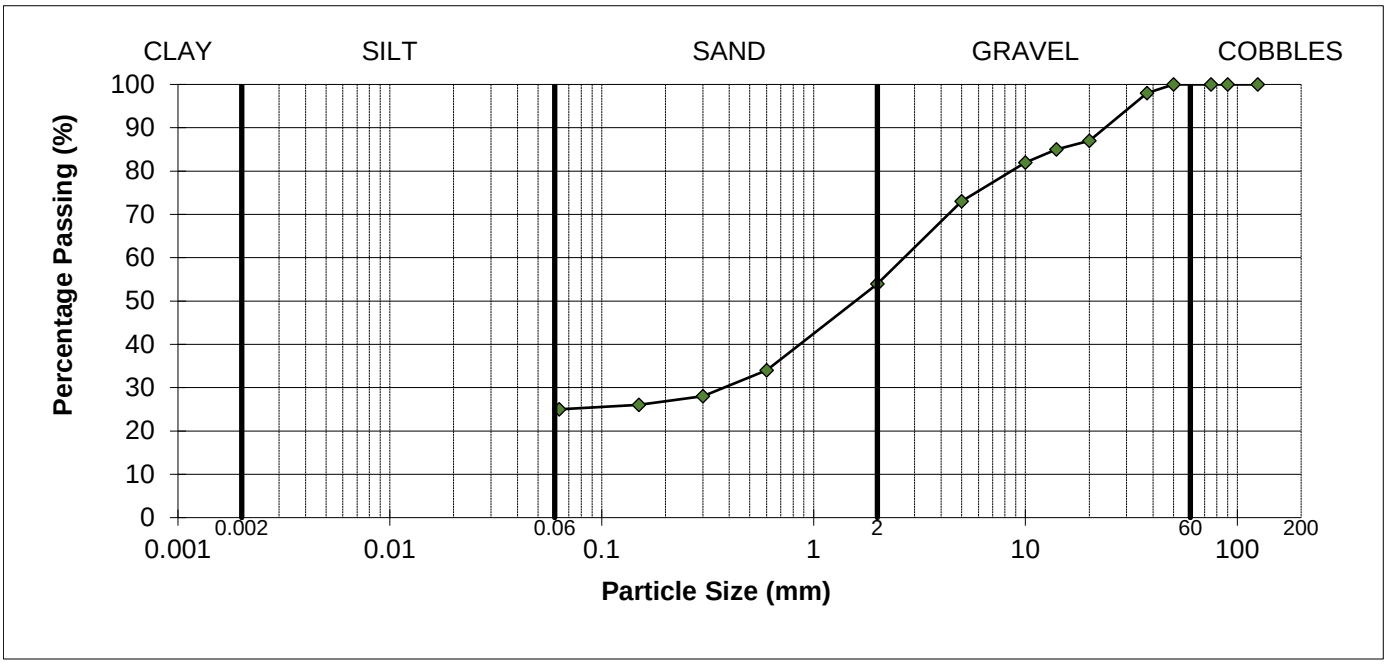
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-SP66-Black Sand	DATE SAMPLED	12-Oct-22
LAB SAMPLE No	117662	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP 66

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	82	
90	100		5	73	
75	100		2	54	
50	100		0.6	34	
37.5	98		0.3	28	
20	87		0.15	26	
14	85		0.063	25	



REMARKS
As received moisture content = 21%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

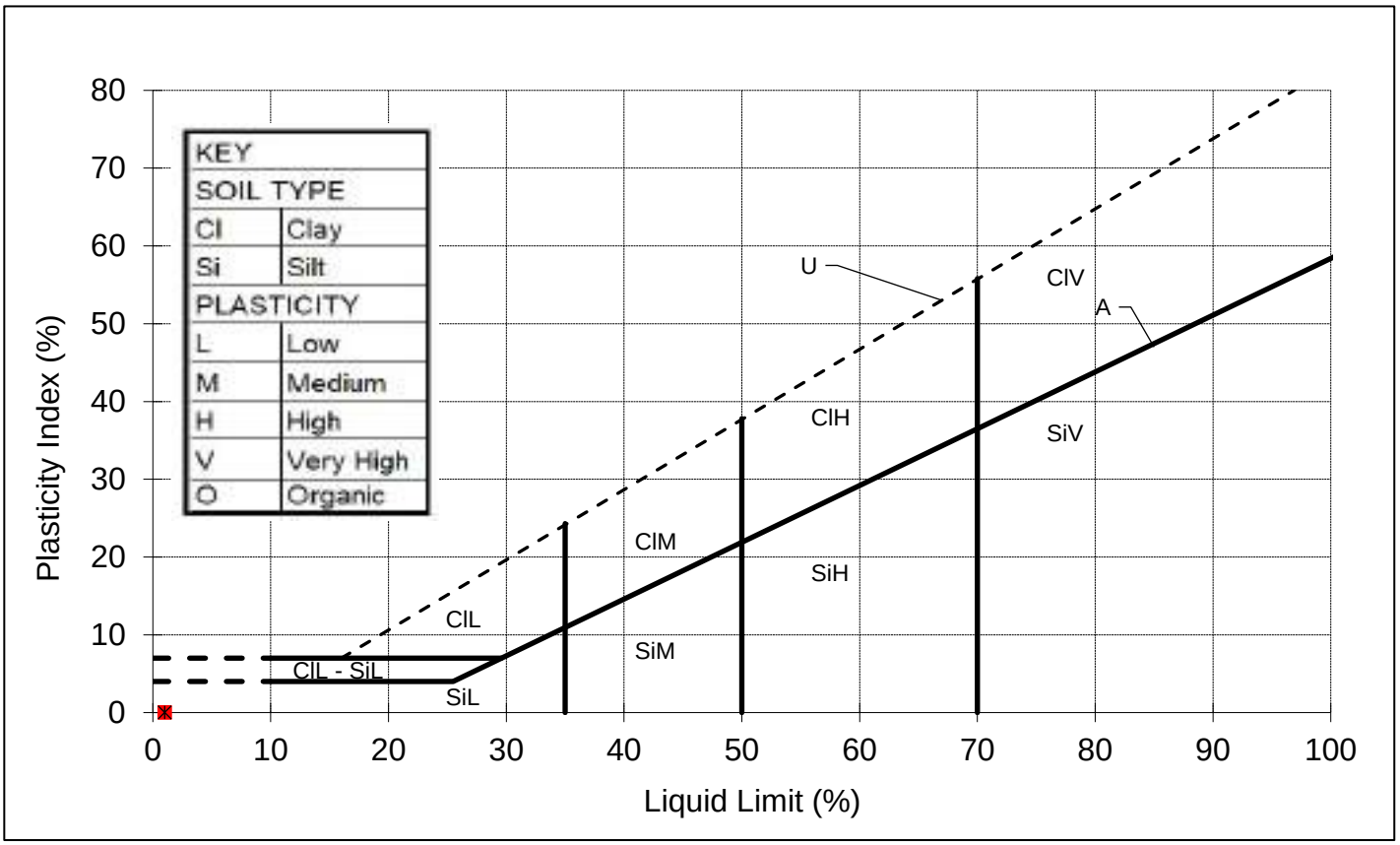
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-SP66-Black Sand	DATE SAMPLED	12-Oct-22
SAMPLE No.	117662	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP 66

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
21	N/A	Non Plastic	N/A	31



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 08-Nov-22

form omcram

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

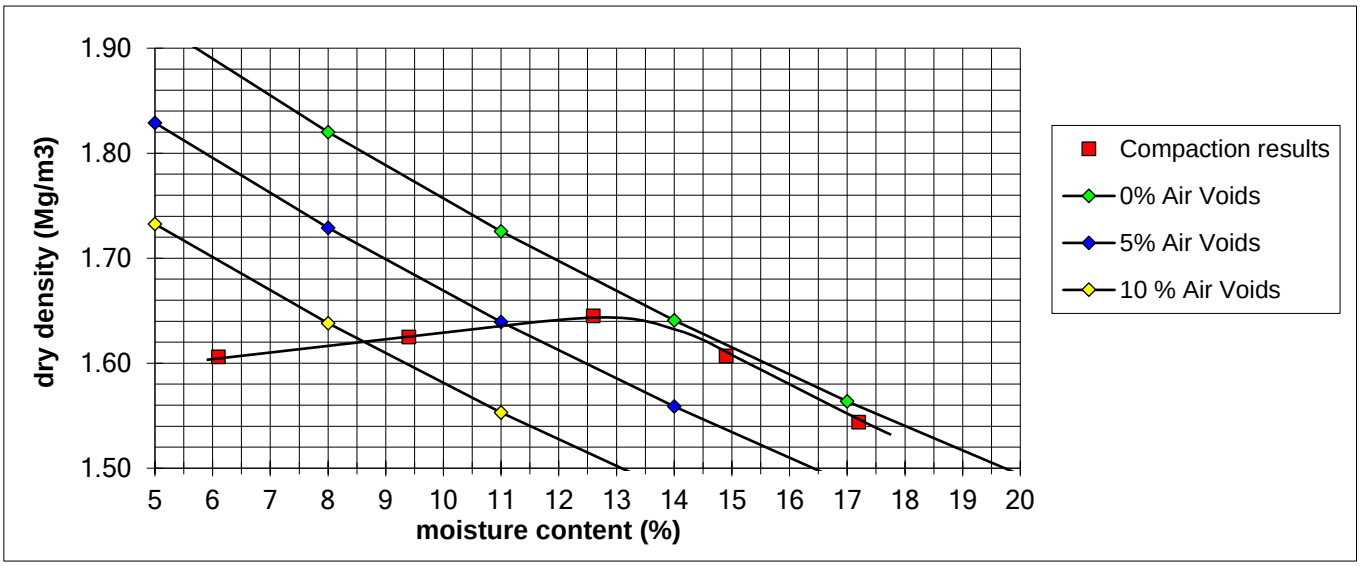
DRY DENSITY/MOISTURE CONTENT RELATIONSHIP 4.5KG RAMMER
BS 1377: PART 4: 1990
PARTICLE DENSITY METHOD BS 1377: PART 2: 1990 Clause 8.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-SP66-Black S	DATE SAMPLED	12-Oct-22
LAB SAMPLE No	117662	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP 66
PRE TREATMENT	Air Dried/Separate Batches

Point Number		Moisture Content (%)	Dry Density (Mg/m3)
1		6.1	1.606
2		9.4	1.625
3		12.6	1.645
4		14.9	1.607
5		17.2	1.544
	Optimum	13.0	
	Maximum		1.64
	Particle Density	2.13 (Measured)	



REMARKS/ABNORMALITIES
Percentage of material retained on 37.5mm sieve = 2%
Percentage of material retained on 20mm sieve = 13%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 9 MULTI STAGE

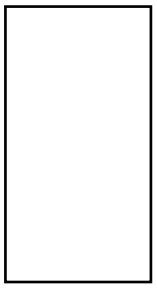
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/88

SAMPLE LABEL	Preclass-SP66-Black Sand	DATE SAMPLED	12-Oct-22
LAB SAMPLE No	117662	DATE RECEIVED	12-Oct-22
DATE TESTED	14-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won - SP 66

SPECIMEN LENGTH	N/A	mm
SPECIMEN DIAMETER	N/A	mm
MOISTURE CONTENT OF SAMPLE	24.5	%
BULK DENSITY	1.65	Mg/m3
DRY DENSITY	1.32	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	N/A	%/min
RUBBER MEMBRANE THICKNESS	N/A	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
N/A	N/A	N/A	N/A	N/A

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer, Sample did not hold together for test after re-compaction.

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 08-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/89
Date of Issue 09 November 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	08-Nov-22	**JOB NUMBER**	MRN 4454/89
MATERIAL	Brown Sand/Gravel		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	H15 L2	225	1.81	1.52	20	96.6	7.2
2	H15 L3	225	1.84	1.55	19	98.5	5.9
3	H15 L4	225	1.83	1.55	19	98.6	6.9
4	H14 L2	225	1.83	1.53	20	97.4	5.9
5	H14 L3	225	1.82	1.53	19	97.2	7.4
6	H14 L4	225	1.78	1.48	20	94.4	8.3
7	I14 L2	225	1.80	1.50	20	95.5	7.6
8	I14 L3	225	1.84	1.55	19	98.9	6.5
9	I14 L4	225	1.86	1.57	18	100.0	6.1
10	I15 L2	225	1.86	1.59	17	101.3	6.6
11	I15 L3	225	1.86	1.58	18	100.9	6.1
12	I15 L4	225	1.88	1.64	15	104.6	7.5
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.57	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 09-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address Whaley Road
Barugh
Barnsley
South Yorkshire
S75 1HT

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/90
Date of Issue 11 November 2022
Page 1 of 13

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

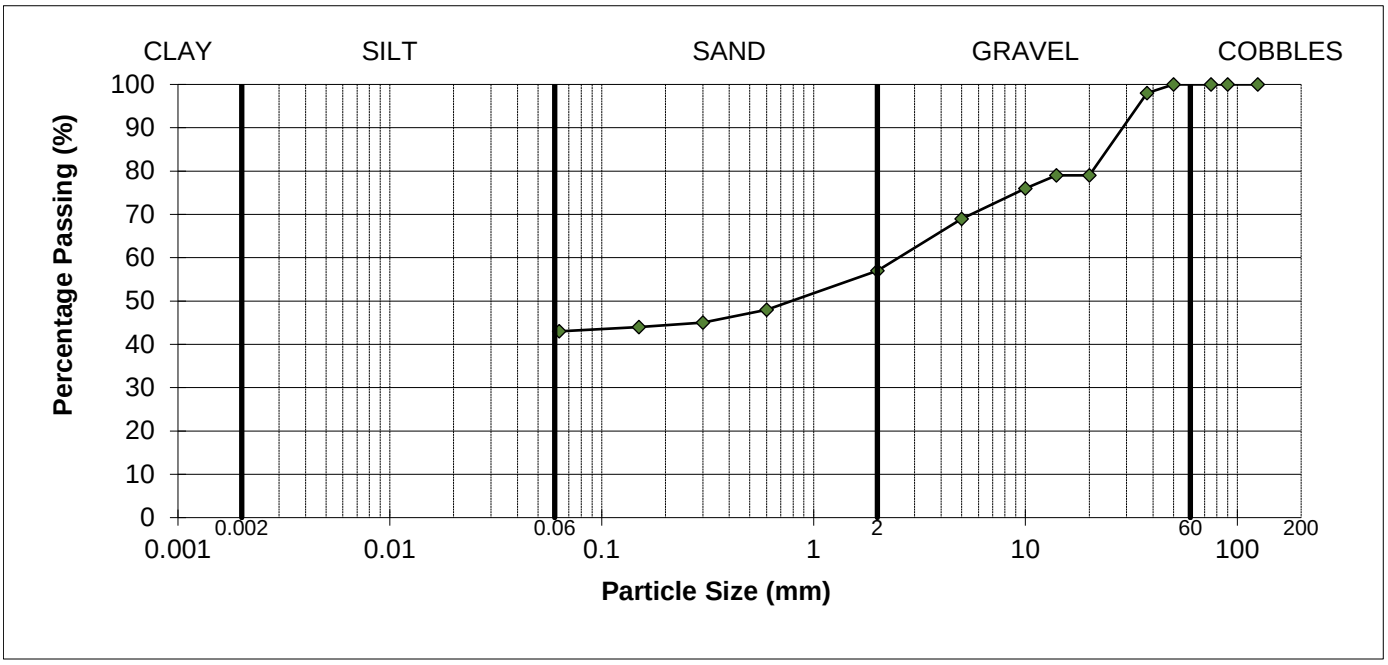
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	C19 L10	DATE SAMPLED	18-Oct-22
LAB SAMPLE No	118349	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	76	
90	100		5	69	
75	100		2	57	
50	100		0.6	48	
37.5	98		0.3	45	
20	79		0.15	44	
14	79		0.063	43	



REMARKS
As received moisture content = 18%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

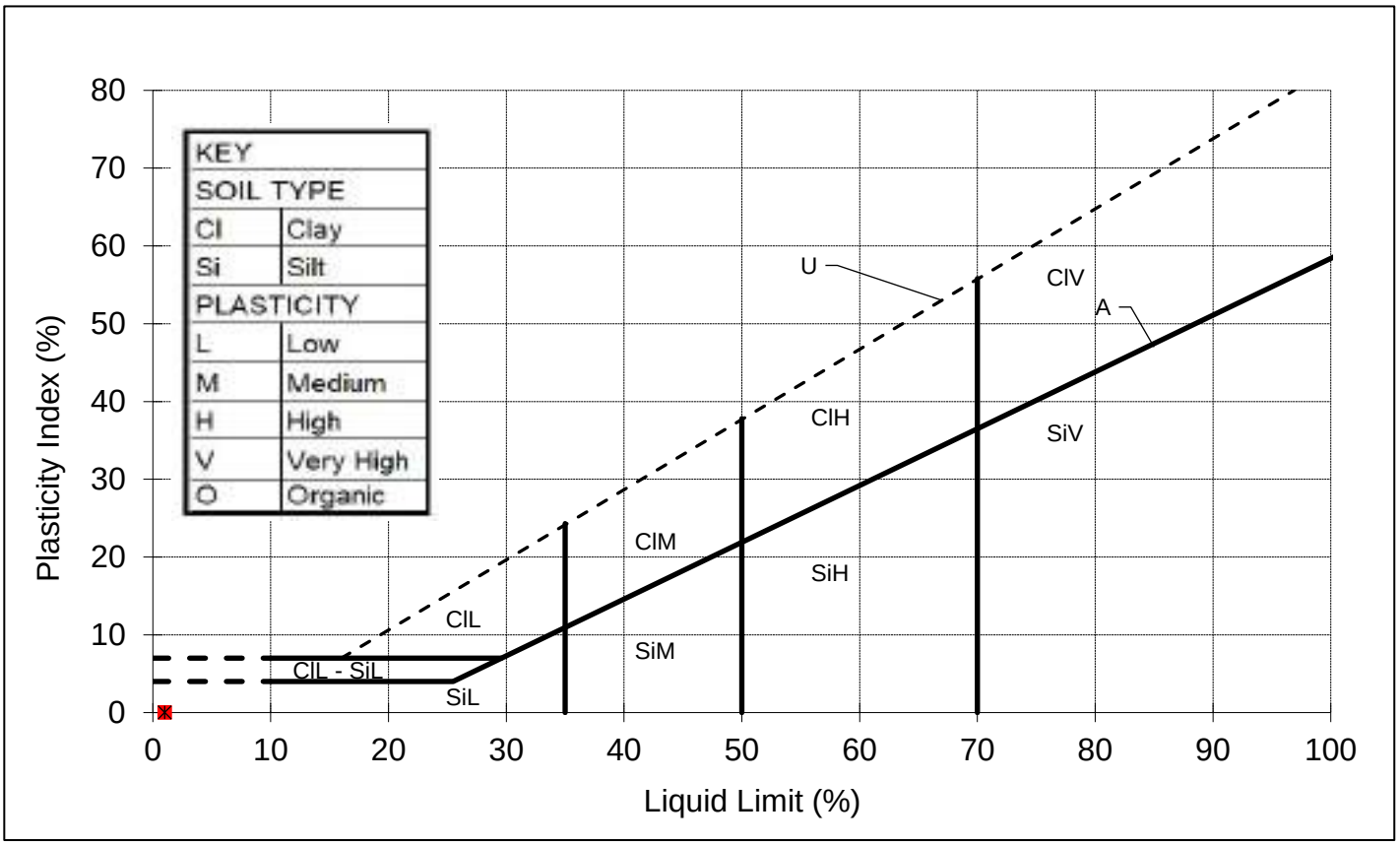
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	C19 L10	DATE SAMPLED	18-Oct-22
SAMPLE No.	118349	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18	N/A	Non Plastic	N/A	36



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

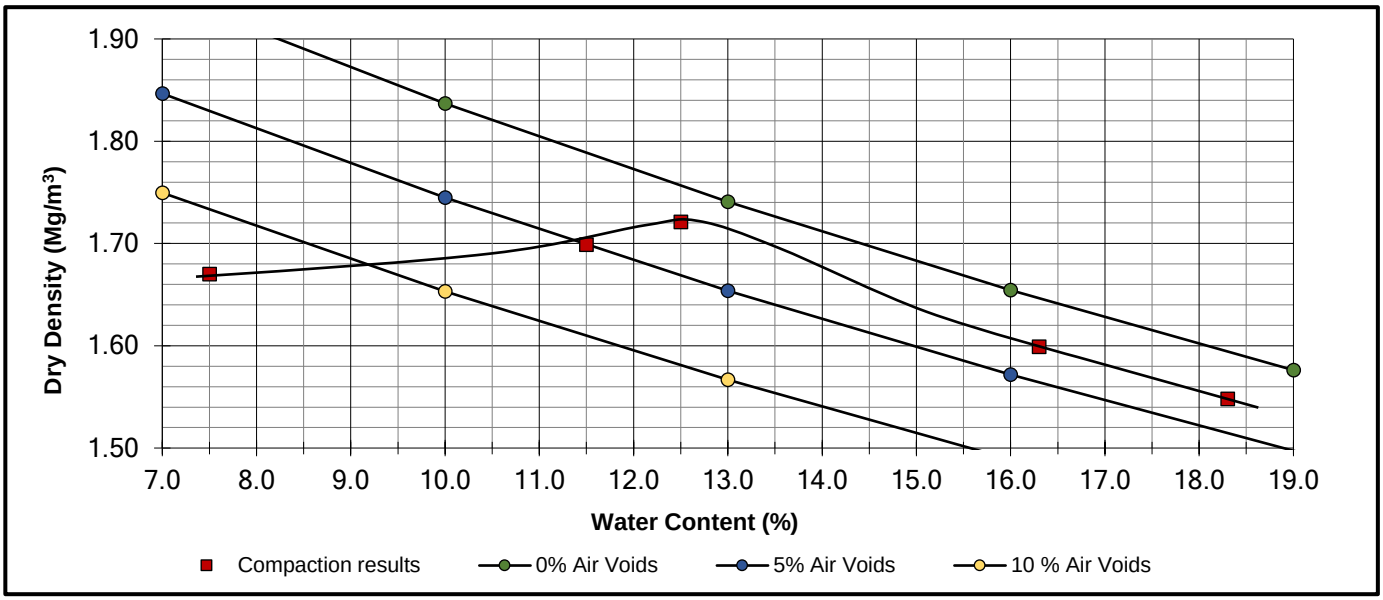
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	C19 L10	DATE SAMPLED	18-Oct-22
SAMPLE NUMBER	118349	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	2 %	GRADING ZONE	Zone 4
RETAINED 20mm	21 %	PARTICLE DENSITY	2.25 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	7.5	1.670
2	11.5	1.699
3	12.5	1.721
4	16.3	1.599
5	18.3	1.548



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**1.70**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 11-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

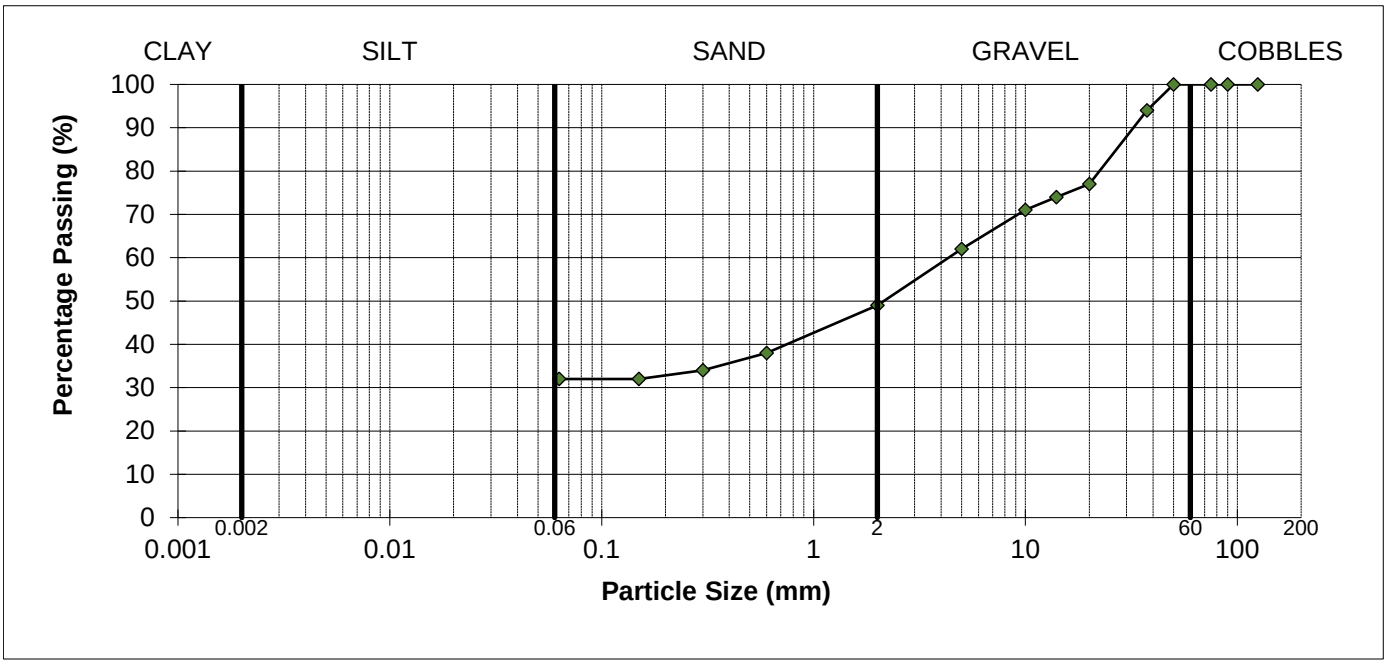
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	A19 L10	DATE SAMPLED	18-Oct-22
LAB SAMPLE No	118350	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	71	
90	100		5	62	
75	100		2	49	
50	100		0.6	38	
37.5	94		0.3	34	
20	77		0.15	32	
14	74		0.063	32	



REMARKS
As received moisture content = 17%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

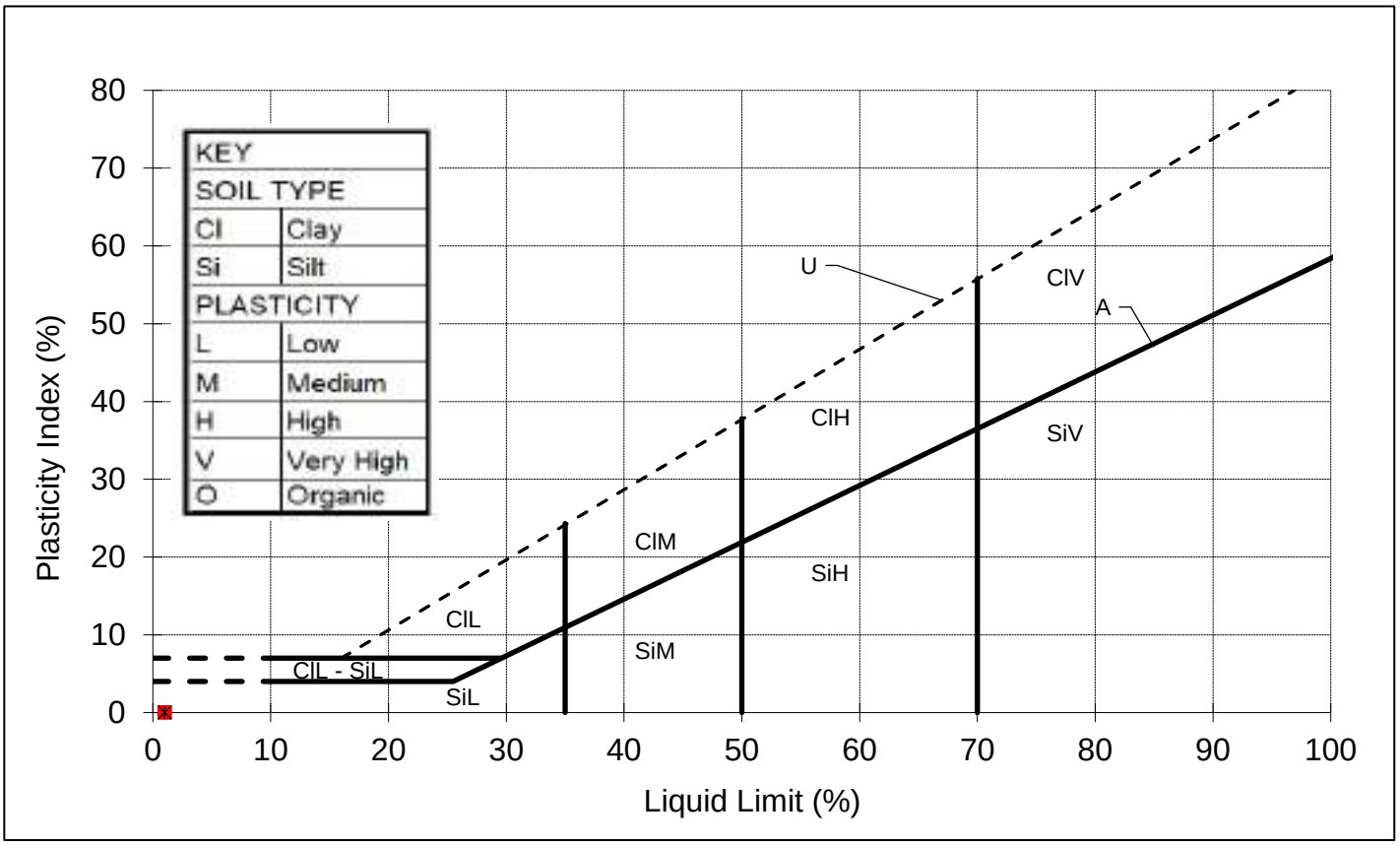
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	A19 L10	DATE SAMPLED	18-Oct-22
SAMPLE No.	118350	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17	N/A	Non Plastic	N/A	36



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

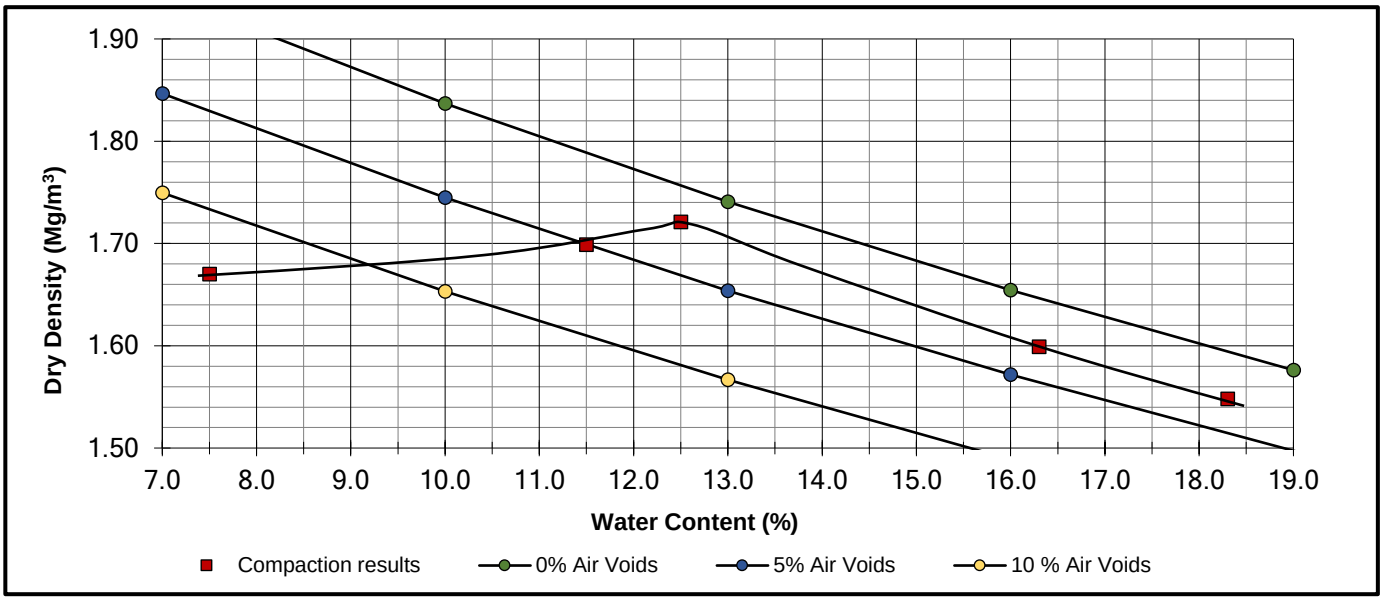
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	A19 L10	DATE SAMPLED	18-Oct-22
SAMPLE NUMBER	118350	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	6 %	GRADING ZONE	Zone 5
RETAINED 20mm	23 %	PARTICLE DENSITY	2.25 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	7.5	1.670
2	11.5	1.699
3	12.5	1.721
4	16.3	1.599
5	18.3	1.548



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**1.70**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

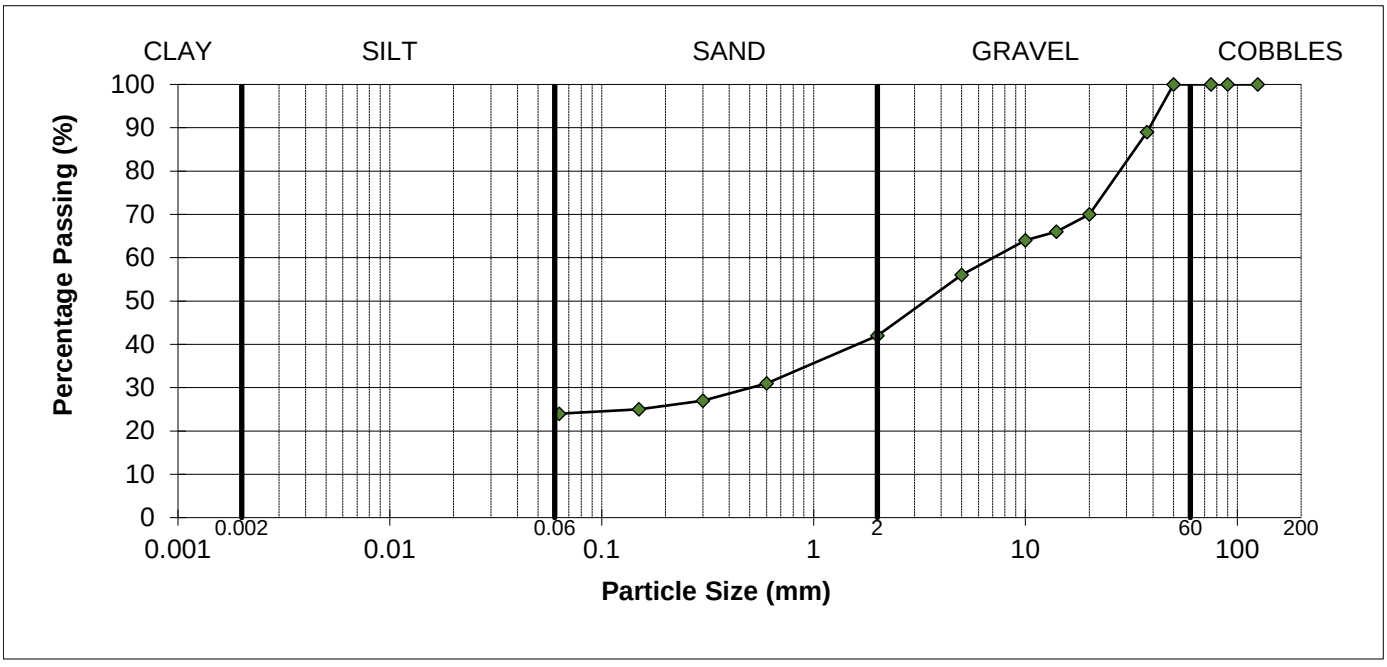
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B18 L10	DATE SAMPLED	18-Oct-22
LAB SAMPLE No	118351	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	64	
90	100		5	56	
75	100		2	42	
50	100		0.6	31	
37.5	89		0.3	27	
20	70		0.15	25	
14	66		0.063	24	



REMARKS
As received moisture content = 11%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

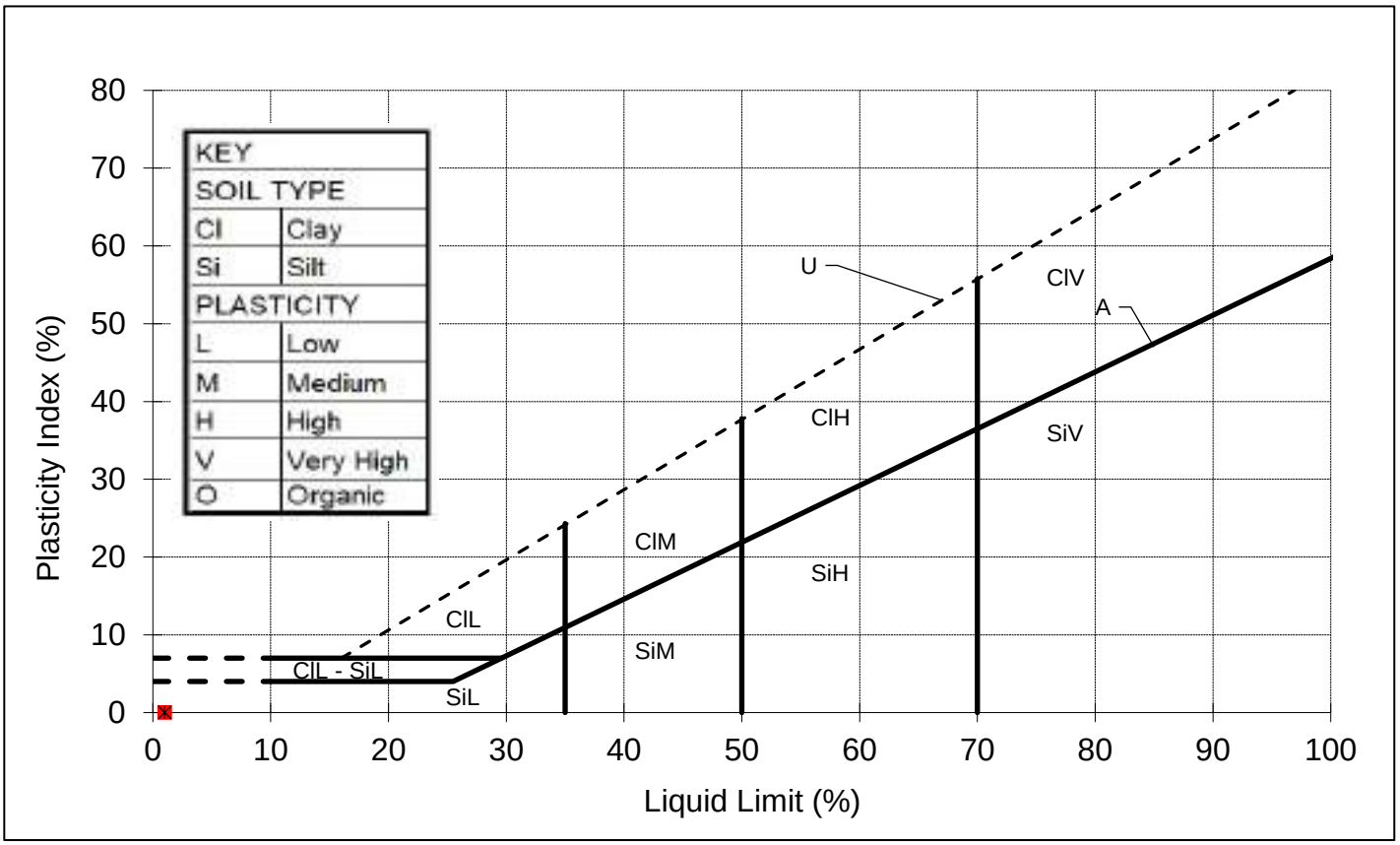
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B18 L10	DATE SAMPLED	18-Oct-22
SAMPLE No.	118351	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
11	N/A	Non Plastic	N/A	28



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

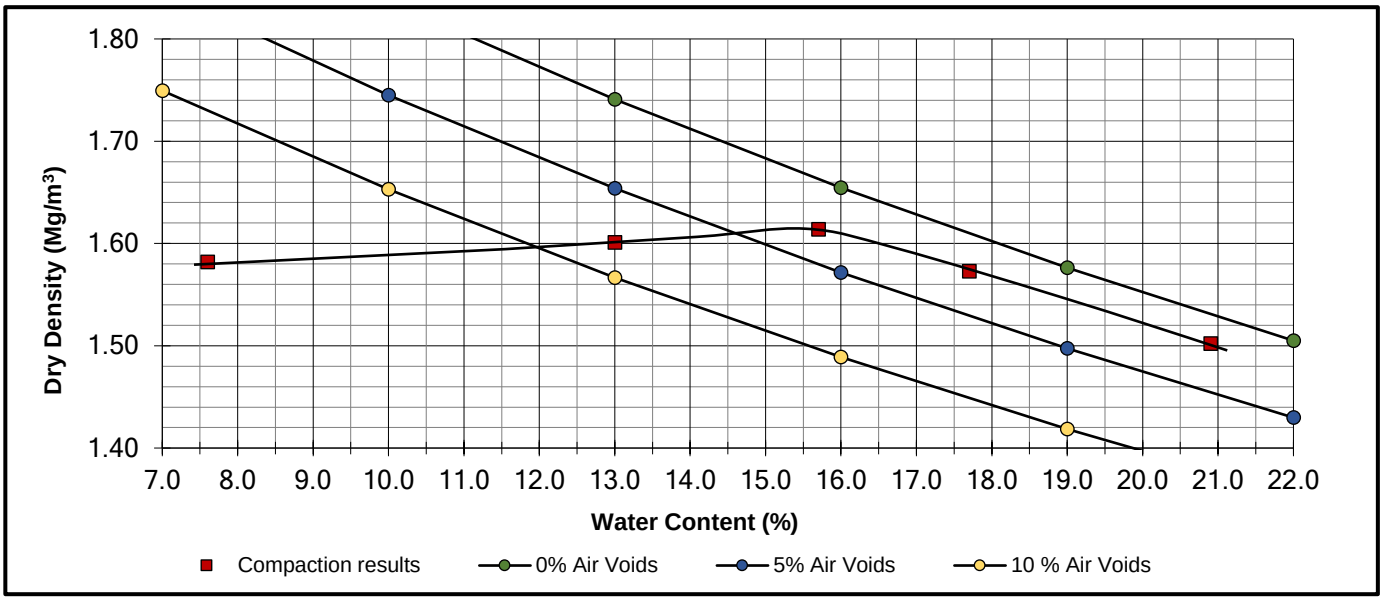
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B18 L10	DATE SAMPLED	18-Oct-22
SAMPLE NUMBER	118351	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	11 %	GRADING ZONE	Zone X
RETAINED 20mm	30 %	PARTICLE DENSITY	2.25 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	7.6	1.582
2	13.0	1.601
3	15.7	1.614
4	17.7	1.573
5	20.9	1.502



OPTIMUM WATER CONTENT	**15**	(%)
MAXIMUM DRY DENSITY	**1.61**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

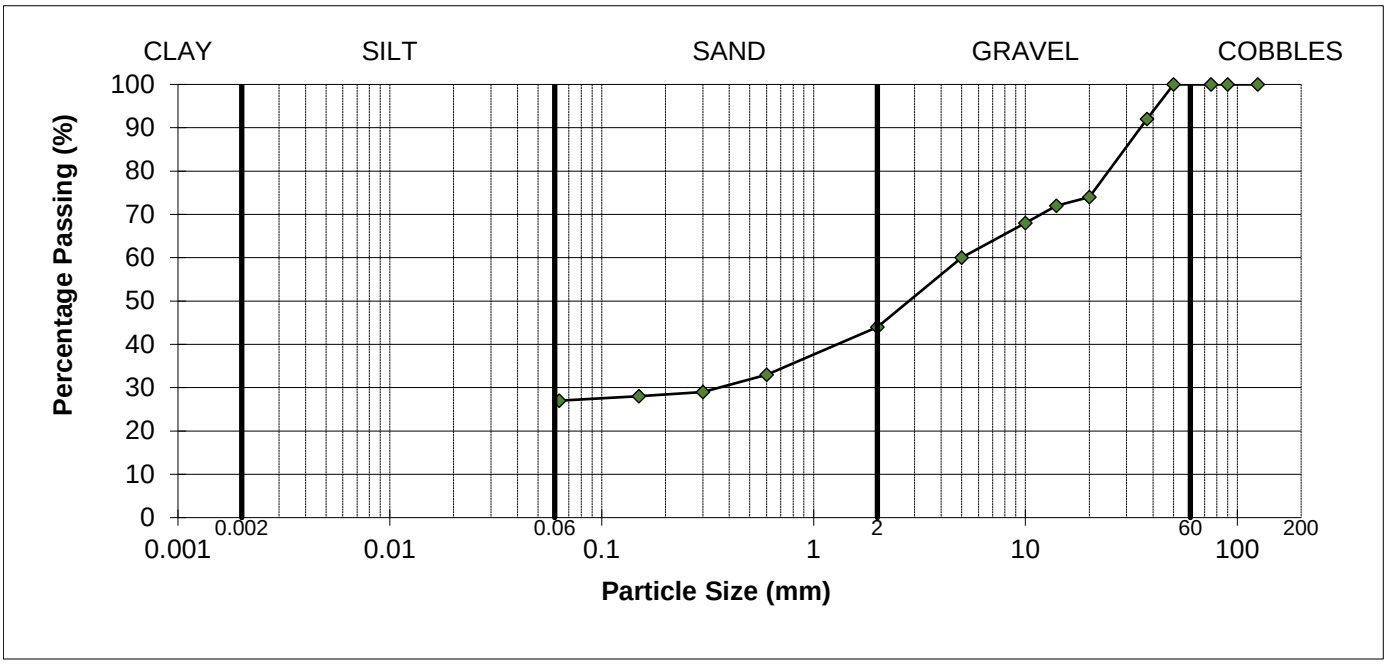
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B19 L10	DATE SAMPLED	18-Oct-22
LAB SAMPLE No	18352	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	68	
90	100		5	60	
75	100		2	44	
50	100		0.6	33	
37.5	92		0.3	29	
20	74		0.15	28	
14	72		0.063	27	



REMARKS
As received moisture content = 14%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

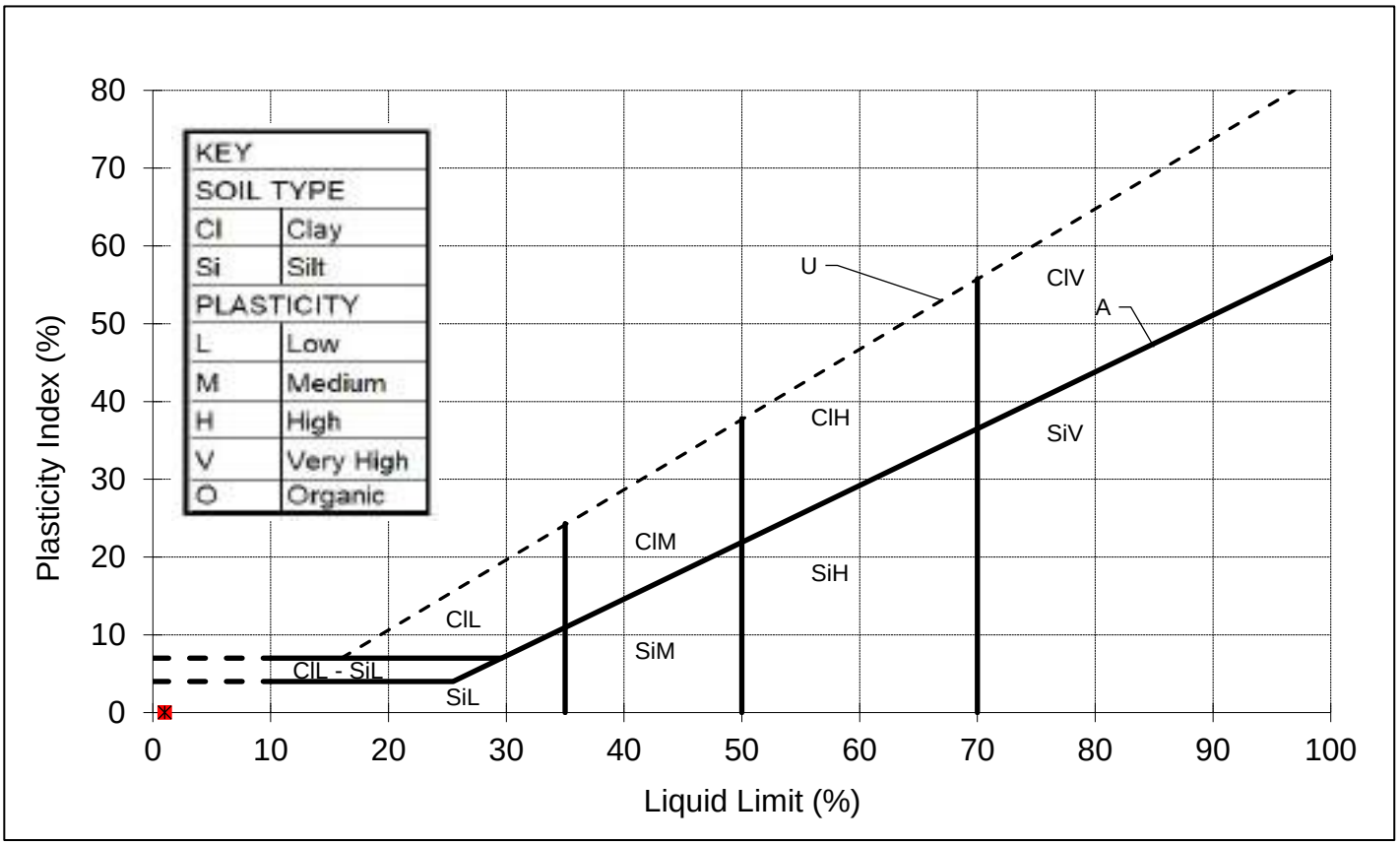
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B19 L10	DATE SAMPLED	18-Oct-22
SAMPLE No.	18352	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14	N/A	Non Plastic	N/A	31



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 11-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

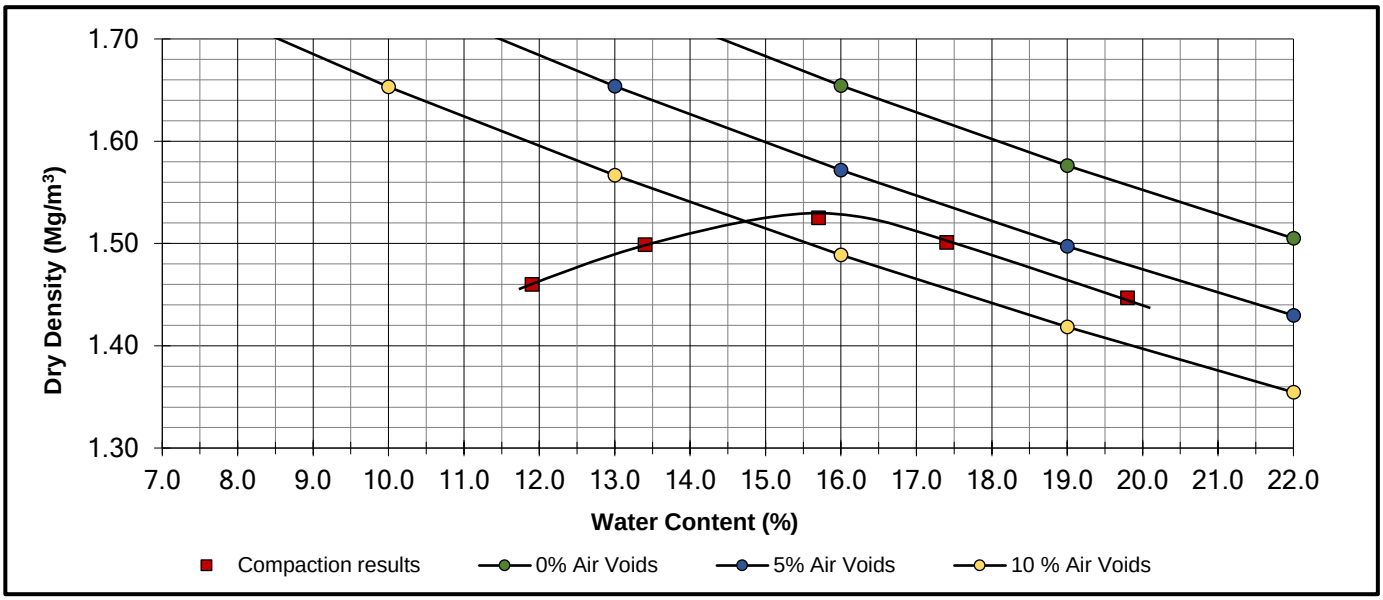
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/90

SAMPLE LABEL	B19 L10	DATE SAMPLED	18-Oct-22
SAMPLE NUMBER	18352	DATE RECEIVED	24-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	8 %	GRADING ZONE	Zone 5
RETAINED 20mm	26 %	PARTICLE DENSITY	2.25 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	11.9	1.460
2	13.4	1.499
3	15.7	1.525
4	17.4	1.501
5	19.8	1.447



OPTIMUM WATER CONTENT	**16**	(%)
MAXIMUM DRY DENSITY	**1.53**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/92
Date of Issue 11 November 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/92

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	08/11/2022
DATE OF TEST	08/11/2022	SAMPLED BY	Murray Rix
DATE TESTED	09/11/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
118764	SRD I12 L1	Brown Sand/Gravel	2.09	1.82	15	101.0	5.3
118765	SRD H14 L4	Brown Sand/Gravel	2.10	1.81	16	100.6	4.0
118766	SRD I14 L4	Brown Sand/Gravel	2.08	1.81	15	100.6	5.8
		Maximum Dry Density (Mg/m^3)		1.80		(Advised by client)	
		Particle Density (Mg/m^3)		2.70		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-Nov-22

MURRAY RIX

CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/93
Date of Issue 15 November 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	14-Nov-22	**JOB NUMBER**	MRN 4454/93
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C14 L6	225	1.68	1.46	15	102.9	3.2
2	C14 L7	225	1.67	1.44	16	101.4	3.1
3	D14 L6	225	1.69	1.48	14	104.4	3.2
4	G12 L9	225	1.65	1.47	12	103.7	6.8
5	E12 L9	225	1.64	1.48	11	104.0	8.0
6	G12 L8	225	1.71	1.47	16	103.8	0.8
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.42	(Advised by client)
					Particle Density (Mg/m3)	1.95	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 23-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	14-Nov-22	**JOB NUMBER**	MRN 4454/93
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	C13 L7	225	1.87	1.64	14	98.8	4.1
2	D13 L7	225	1.86	1.62	15	97.4	3.9
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.66	(Advised by client)
					Particle Density (Mg/m3)	2.25	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 23-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	14-Nov-22	**JOB NUMBER**	MRN 4454/93
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	E9 L11	225	2.01	1.76	14	98.5	0.3
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.79	(Advised by client)
					Particle Density (Mg/m3)	2.35	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 23-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	14-Nov-22	**JOB NUMBER**	MRN 4454/93
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D12 L10	225	1.79	1.58	13	100.9	6.6
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.57	(Advised by client)
					Particle Density (Mg/m3)	2.18	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 23-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/93		
TEST LOCATION	Test 01 - G13 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	14-Nov-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4672	4650	4544	4622	0.00	0.00	0.0
4518	4509	4382	4470	-1.52	8.00	28.3
4556	4553	4431	4513	-1.09	0.00	0.0
4530	4524	4402	4485	-1.37	5.00	17.7
4503	4497	4376	4459	-1.63	8.00	28.3
4465	4460	4341	4422	-2.00	12.00	42.4
4448	4450	4293	4397	-2.25	15.00	53.1
4395	4420	4279	4365	-2.57	20.00	70.7
4342	4361	4217	4307	-3.15	25.00	88.4
4420	4418	4281	4373	-2.49	0.00	0.0
4393	4393	4256	4347	-2.75	6.00	21.2
4366	4370	4230	4322	-3.00	10.00	35.4
4335	4340	4203	4293	-3.29	16.00	56.6
4301	4313	4173	4262	-3.60	18.00	63.7
4264	4276	4140	4227	-3.95	22.00	77.8
4231	4248	4110	4196	-4.26	24.00	84.9
4337	4361	4202	4300	-3.22	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	69	kPa
Modulus of subgrade reaction (k) =	55	MPa/m
Equivalent 762 mm plate reaction =	45	MPa/m
Equivalent CBR =	7.0	%
Surface Stiffness Modulus (E) =	61	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

DATE 15-Nov-22

MURRAY RIX

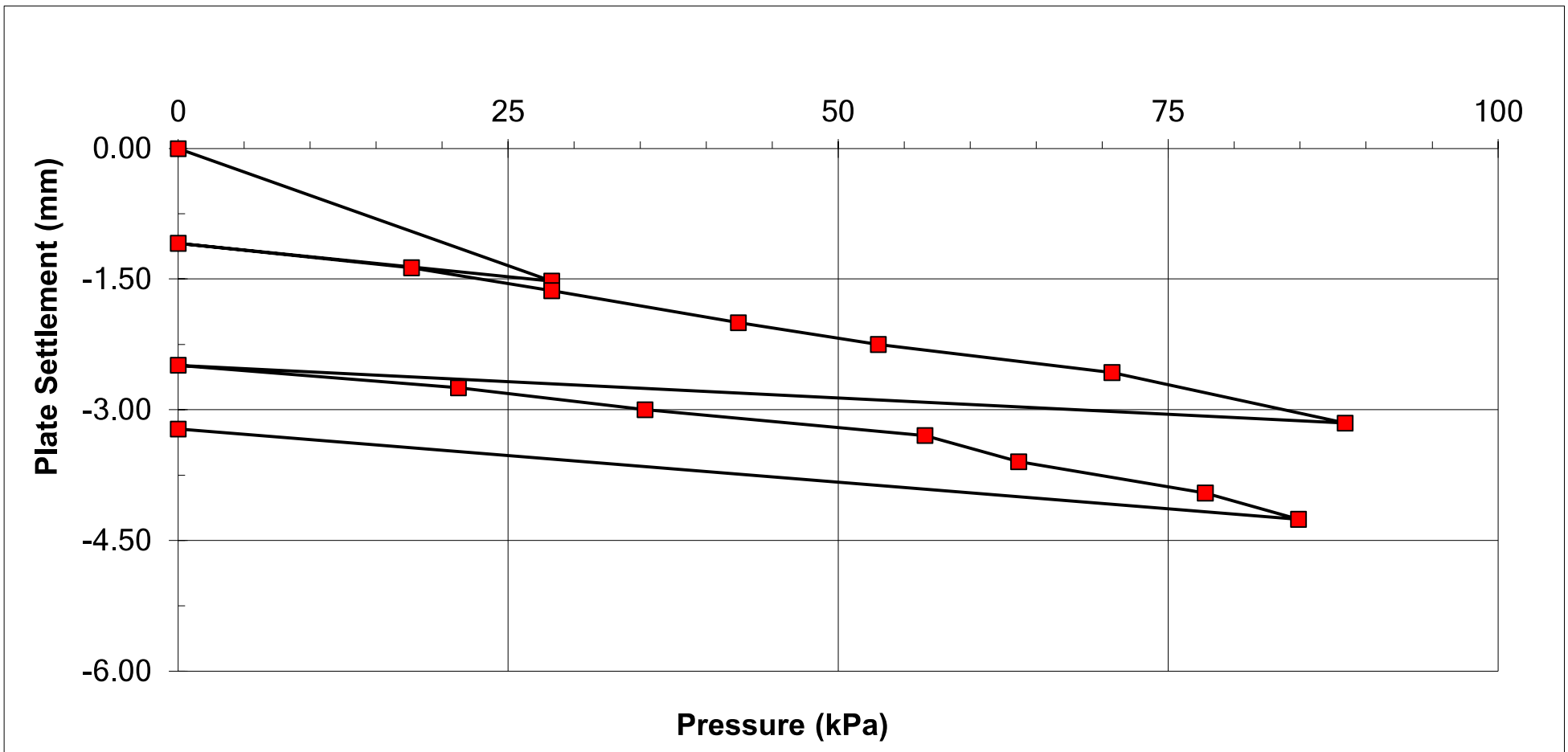
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

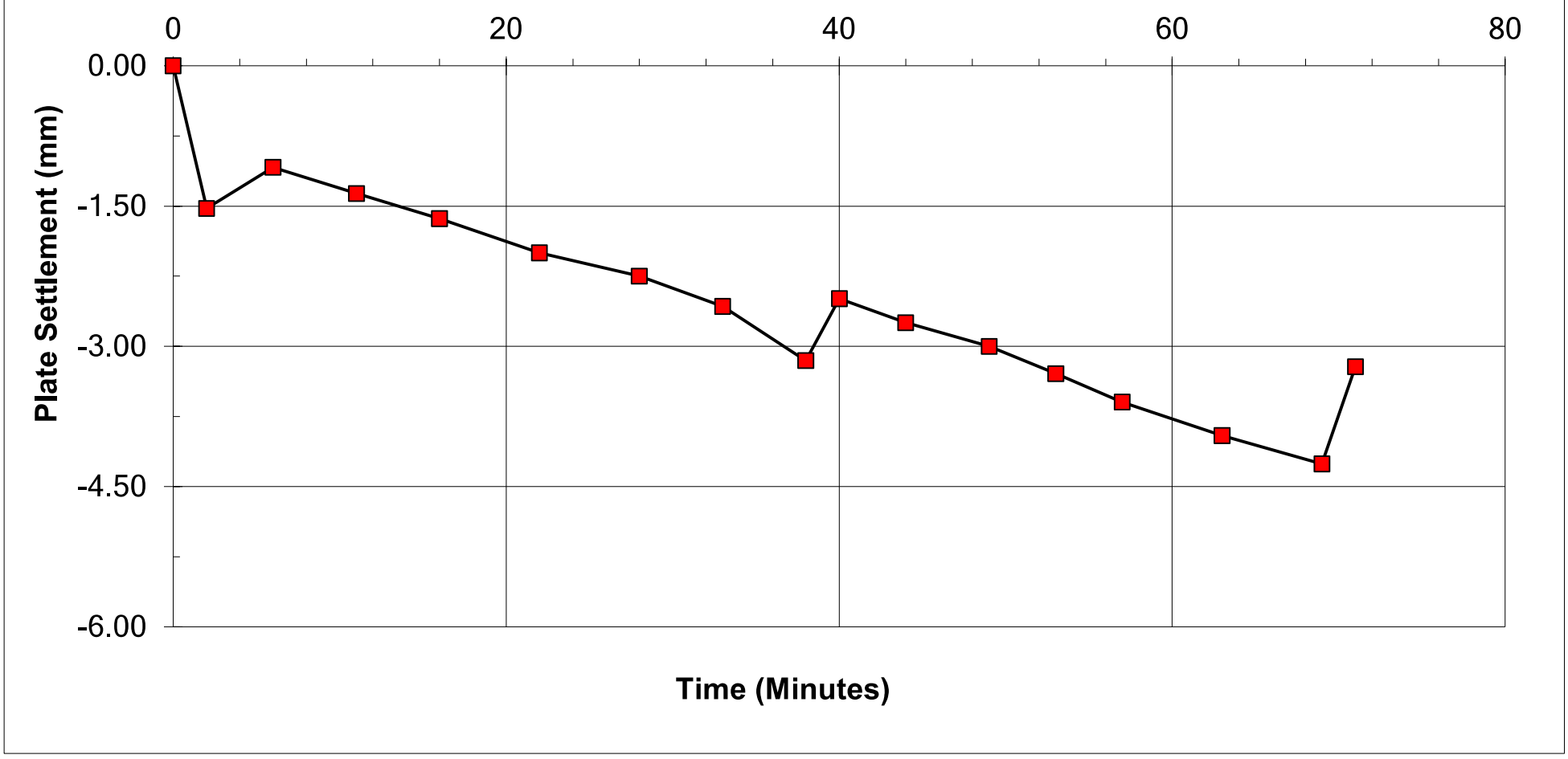
UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons) DATE 15-Nov-22
(Laboratory Manager)

MURRAY RIX

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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc						
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP						
JOB NUMBER	MRN 4454/93						
TEST LOCATION	Test 02 - H12 L4		LOADING DEVICE		20 Tonne Enerpac Jack		
TEST DATE	14-Nov-22		PLATE SIZE (mm)		600 diameter		
TEST DEPTH	Surface		REACTION LOAD USED		Site Plant		
MATERIAL UNDER TEST		Black Ash/Sand		MOISTURE CONTENT		Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4561	4768	4720	4683	0.00	0.00	0.0
4427	4645	4568	4547	-1.36	8.00	28.3
4439	4674	4576	4563	-1.20	0.00	0.0
4409	4650	4545	4535	-1.48	8.00	28.3
4368	4617	4518	4501	-1.82	13.00	46.0
4334	4578	4480	4464	-2.19	19.00	67.2
4304	4558	4456	4439	-2.44	22.00	77.8
4266	4507	4407	4393	-2.90	31.00	109.6
4236	4477	4380	4364	-3.19	37.00	130.9
4289	4537	4425	4417	-2.66	0.00	0.0
4262	4512	4400	4391	-2.92	5.00	17.7
4235	4489	4374	4366	-3.17	10.00	35.4
4204	4459	4347	4337	-3.46	16.00	56.6
4170	4432	4317	4306	-3.77	22.00	77.8
4133	4395	4284	4271	-4.12	30.00	106.1
4100	4367	4254	4240	-4.43	38.00	134.4
4206	4480	4346	4344	-3.39	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	79	kPa
Modulus of subgrade reaction (k) =	63	MPa/m
Equivalent 762 mm plate reaction =	51	MPa/m
Equivalent CBR =	8.7	%
Surface Stiffness Modulus (E) =	70	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	89	kPa
Modulus of subgrade reaction (k) =	71	MPa/m
Equivalent 762 mm plate reaction =	57	MPa/m
Equivalent CBR =	10.8	%
Surface Stiffness Modulus (E) =	81	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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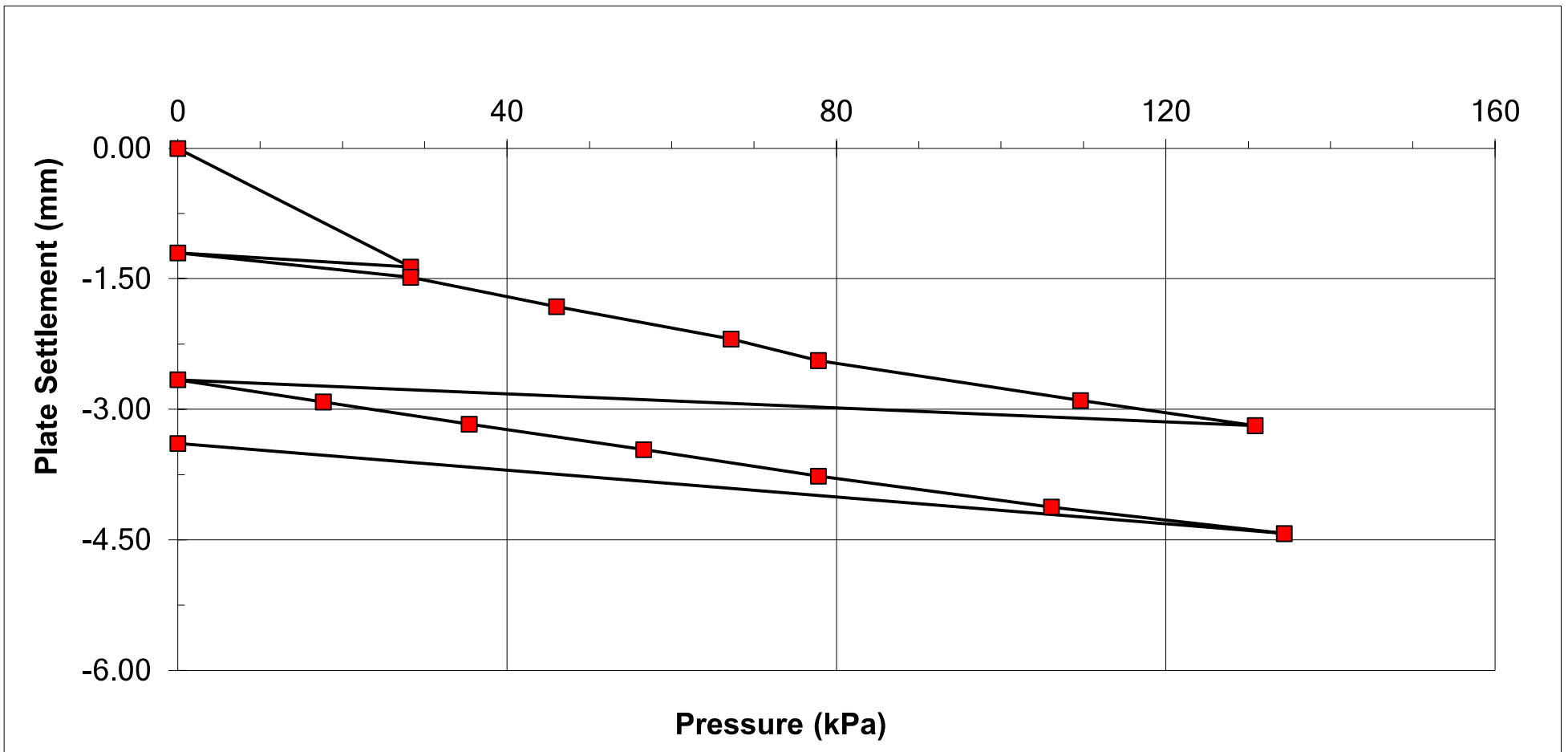
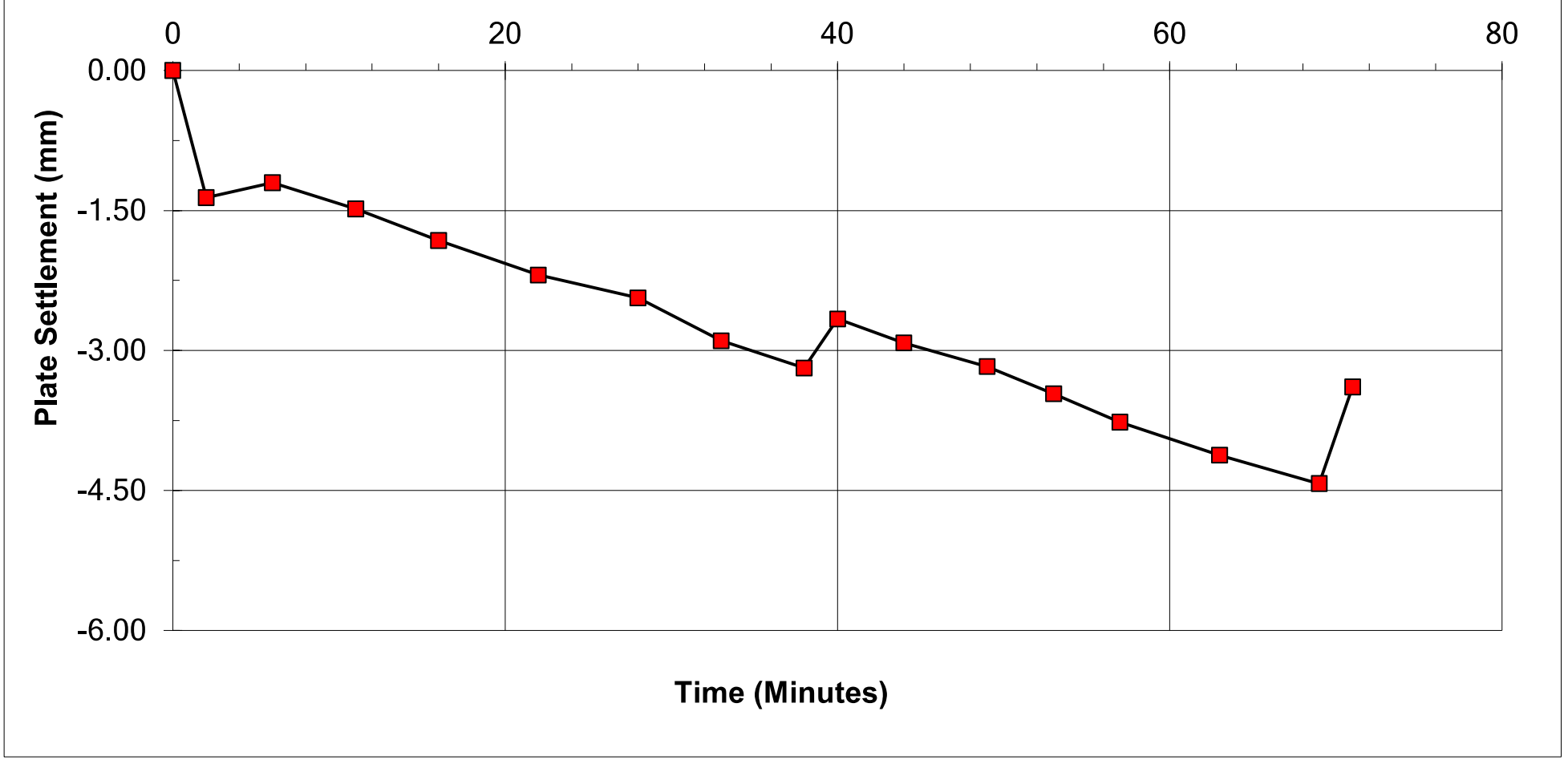
UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons) DATE 15-Nov-22
(Laboratory Manager)

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc						
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP						
JOB NUMBER	MRN 4454/93						
TEST LOCATION	Test 03 - H14 L4		LOADING DEVICE		20 Tonne Enerpac Jack		
TEST DATE	14-Nov-22		PLATE SIZE (mm)		600 diameter		
TEST DEPTH	Surface		REACTION LOAD USED		Site Plant		
MATERIAL UNDER TEST		Brown Sand/Gravel		MOISTURE CONTENT		Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4561	4745	4589	4632	0.00	0.00	0.0
4485	4645	4446	4525	-1.06	8.00	28.3
4495	4654	4451	4533	-0.98	0.00	0.0
4460	4630	4435	4508	-1.23	8.00	28.3
4400	4585	4389	4458	-1.74	12.00	42.4
4344	4551	4362	4419	-2.13	16.00	56.6
4298	4520	4325	4381	-2.51	20.00	70.7
4255	4484	4278	4339	-2.93	28.00	99.0
4213	4446	4240	4300	-3.32	32.00	113.2
4385	4498	4352	4412	-2.20	0.00	0.0
4360	4450	4312	4374	-2.58	8.00	28.3
4340	4420	4299	4353	-2.79	12.00	42.4
4310	4403	4269	4327	-3.04	16.00	56.6
4270	4376	4238	4295	-3.37	20.00	70.7
4223	4328	4197	4249	-3.82	28.00	99.0
4178	4265	4153	4199	-4.33	32.00	113.2
4235	4312	4239	4262	-3.70	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	61	kPa
Modulus of subgrade reaction (k) =	48	MPa/m
Equivalent 762 mm plate reaction =	39	MPa/m
Equivalent CBR =	5.5	%
Surface Stiffness Modulus (E) =	52	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	76	kPa
Modulus of subgrade reaction (k) =	61	MPa/m
Equivalent 762 mm plate reaction =	49	MPa/m
Equivalent CBR =	8.1	%
Surface Stiffness Modulus (E) =	67	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 15-Nov-22

MURRAY RIX

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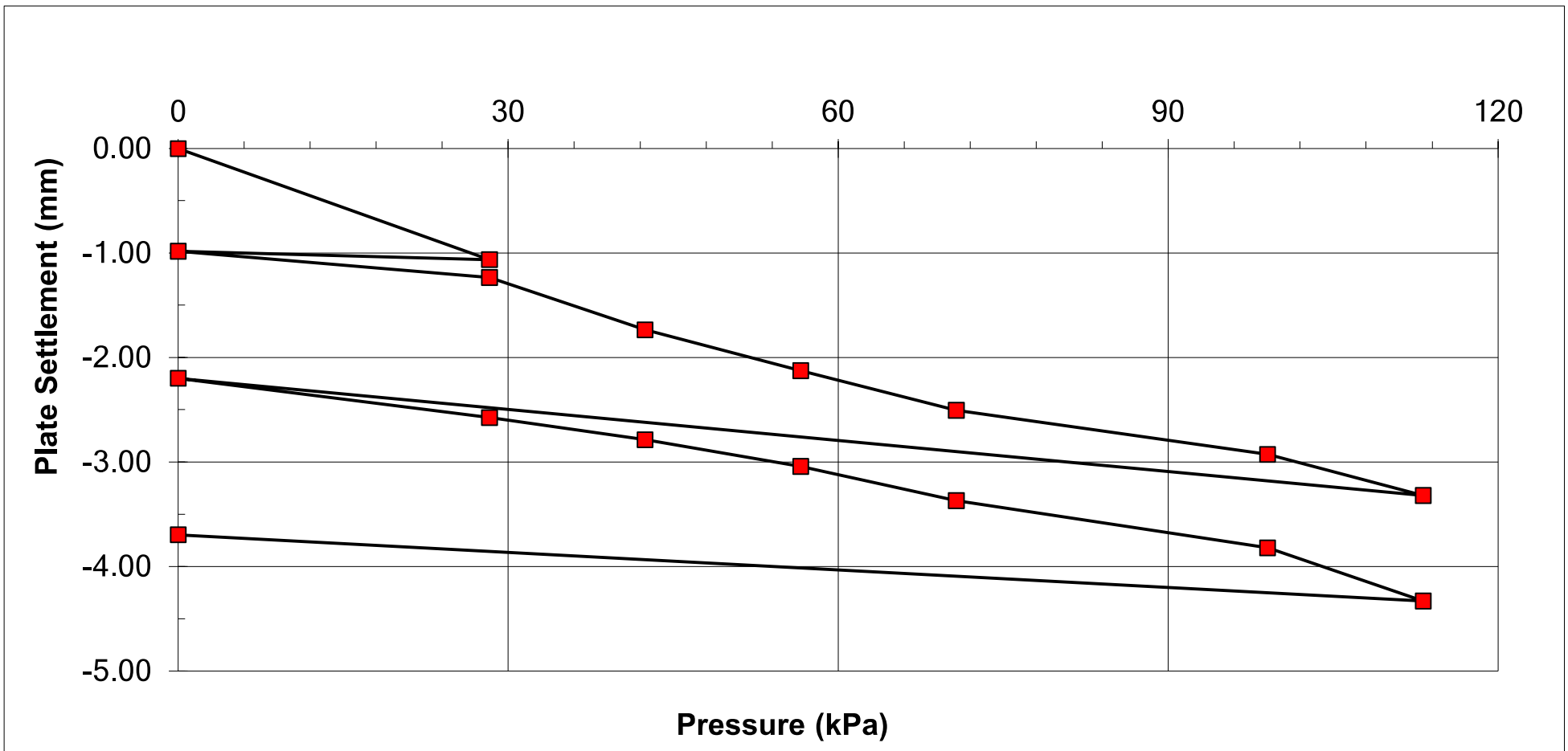
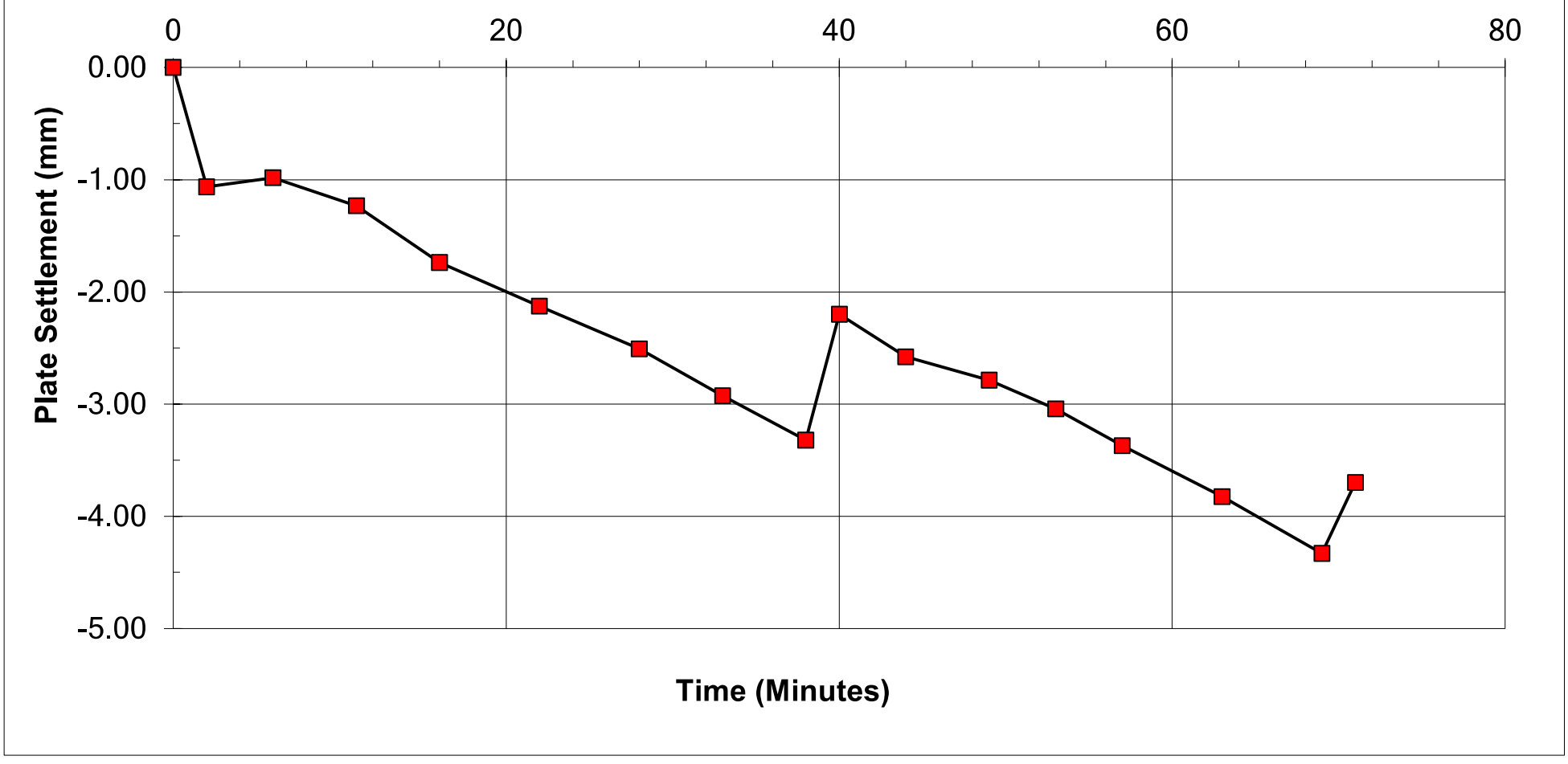
UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons) DATE 15-Nov-22
(Laboratory Manager)

MURRAY RIX

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc				
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP				
JOB NUMBER	MRN 4454/93				
TEST LOCATION	Test 05 - H15 L4	LOADING DEVICE	20 Tonne Enerpac Jack		
TEST DATE	14-Nov-22	PLATE SIZE (mm)	600 diameter		
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant		
MATERIAL UNDER TEST	Brown Sand/Gravel	MOISTURE CONTENT	Not Required		

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4655	4711	4703	4690	0.00	0.00	0.0
4497	4575	4537	4536	-1.53	11.00	38.9
4531	4623	4579	4578	-1.12	0.00	0.0
4504	4600	4546	4550	-1.40	8.00	28.3
4477	4573	4517	4522	-1.67	11.00	38.9
4448	4550	4482	4493	-1.96	15.00	53.1
4418	4525	4447	4463	-2.26	19.00	67.2
4384	4491	4400	4425	-2.65	22.00	77.8
4347	4466	4370	4394	-2.95	25.00	88.4
4436	4539	4477	4484	-2.06	0.00	0.0
4406	4517	4450	4458	-2.32	6.00	21.2
4379	4491	4424	4431	-2.58	10.00	35.4
4348	4467	4390	4402	-2.88	15.00	53.1
4317	4441	4362	4373	-3.16	20.00	70.7
4287	4414	4329	4343	-3.46	23.00	81.3
4258	4390	4298	4315	-3.74	27.00	95.5
4383	4493	4449	4442	-2.48	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	70	kPa
Modulus of subgrade reaction (k) =	56	MPa/m
Equivalent 762 mm plate reaction =	45	MPa/m
Equivalent CBR =	7.1	%
Surface Stiffness Modulus (E) =	62	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	76	kPa
Modulus of subgrade reaction (k) =	61	MPa/m
Equivalent 762 mm plate reaction =	49	MPa/m
Equivalent CBR =	8.1	%
Surface Stiffness Modulus (E) =	67	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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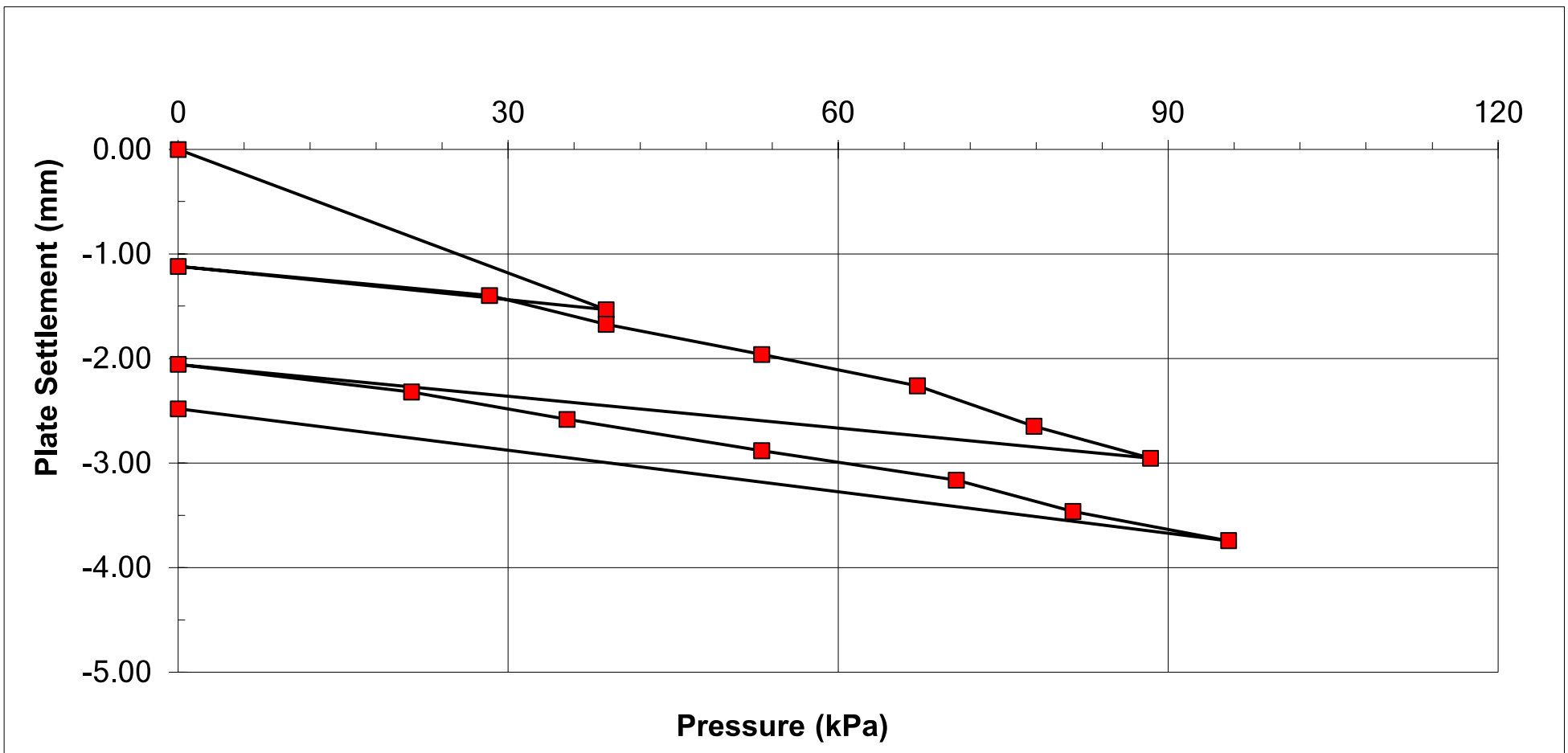
TEL 0161 475 0870

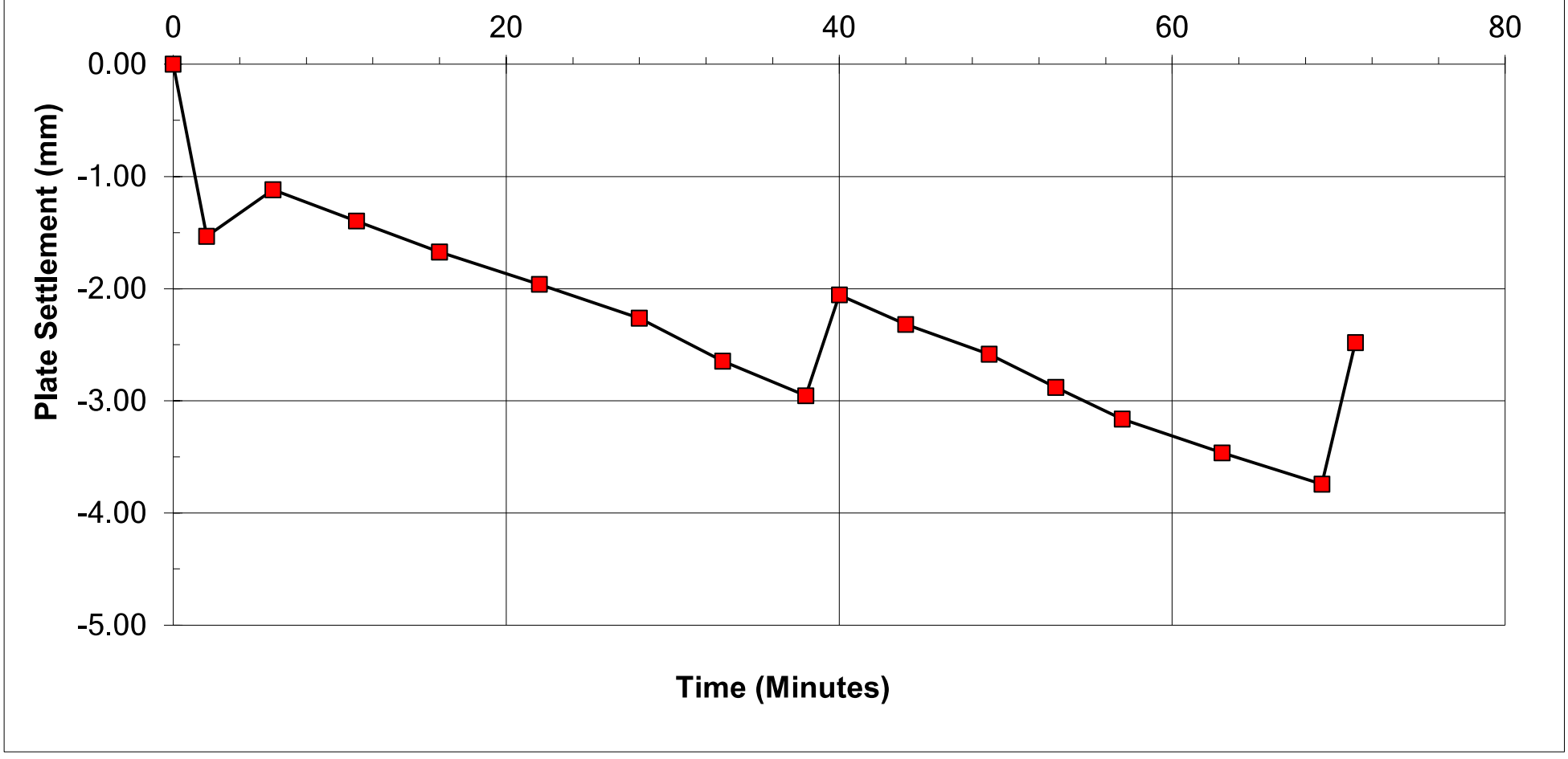
UKAS TESTING 1580

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons) DATE 15-Nov-22
(Laboratory Manager)

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/95
Date of Issue 15 November 2022
Page 1 of 16

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

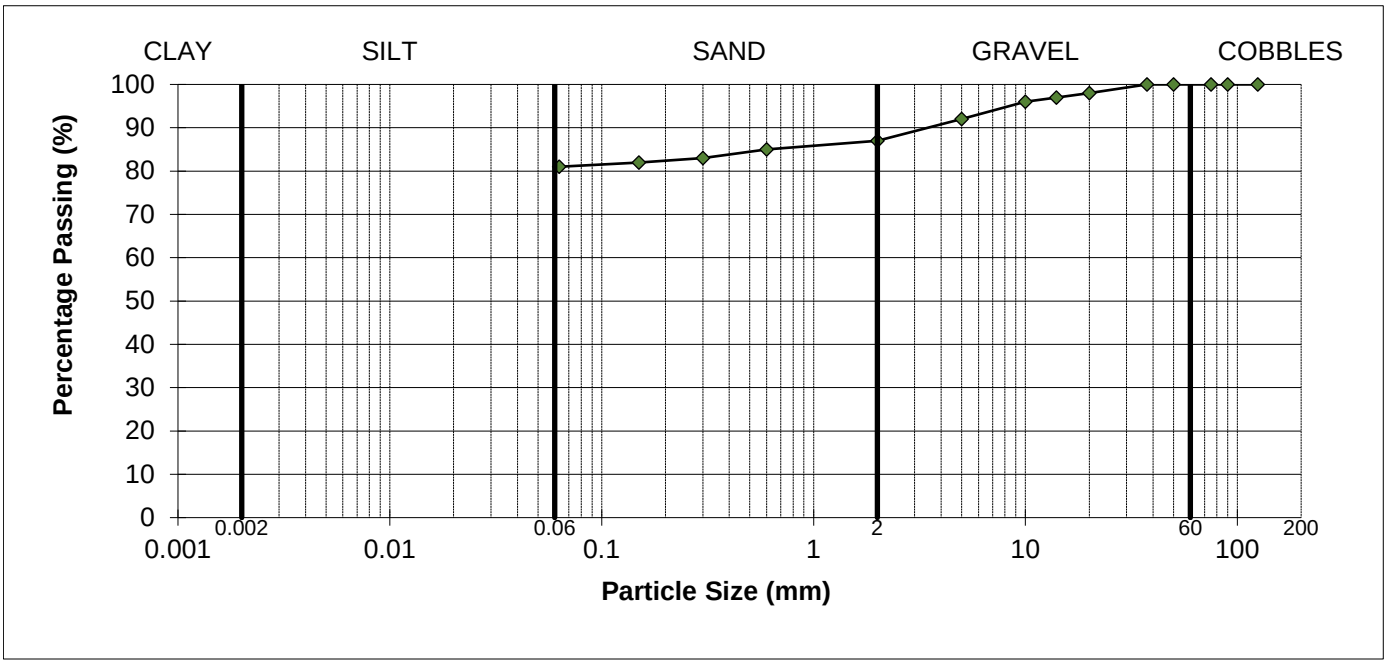
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-1	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118515	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	96	
90	100		5	92	
75	100		2	87	
50	100		0.6	85	
37.5	100		0.3	83	
20	98		0.15	82	
14	97		0.063	81	



REMARKS
As received moisture content = 13.6%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

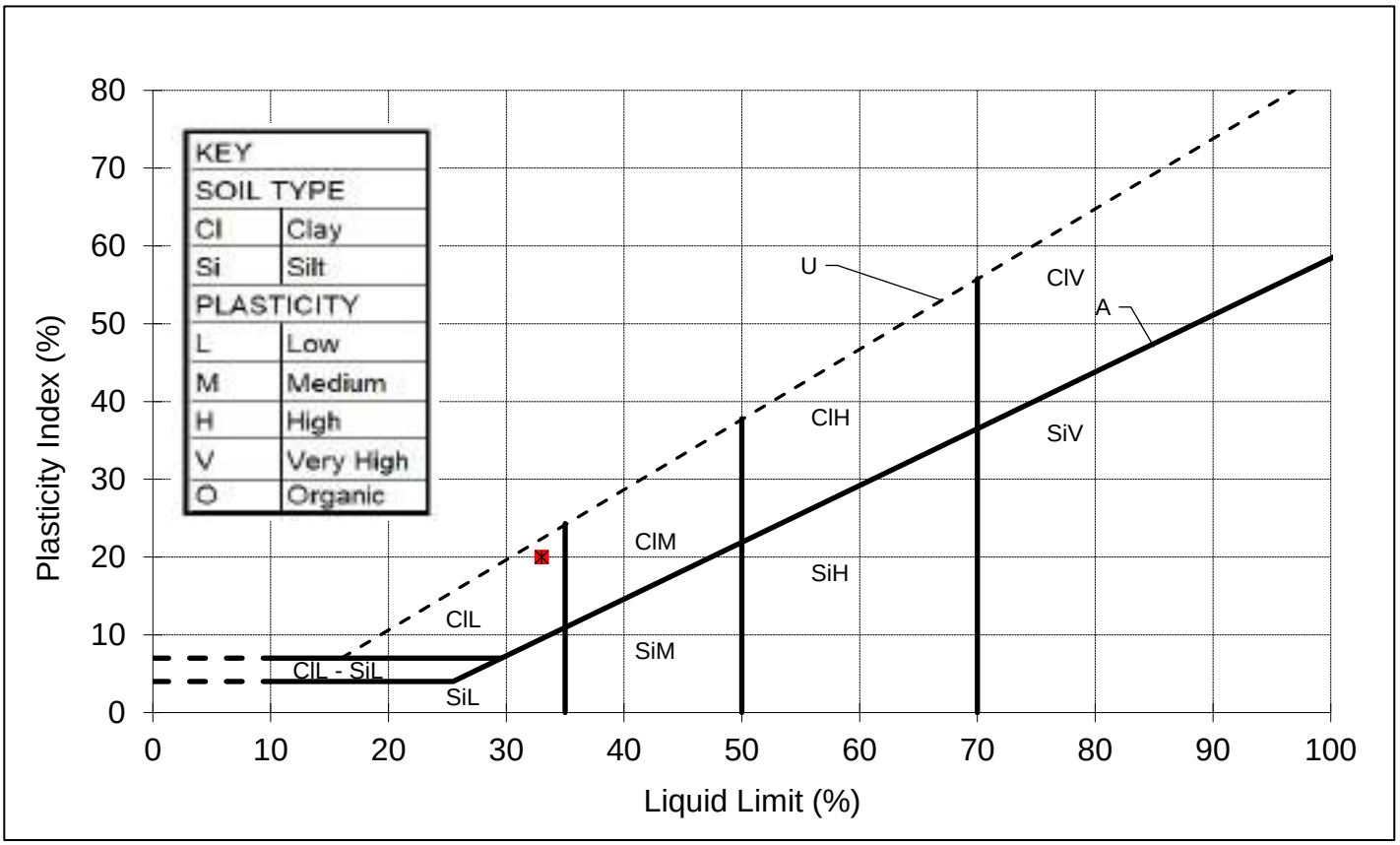
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-1	DATE SAMPLED	27-Oct-22
SAMPLE No.	118515	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14	33	13	20	83



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

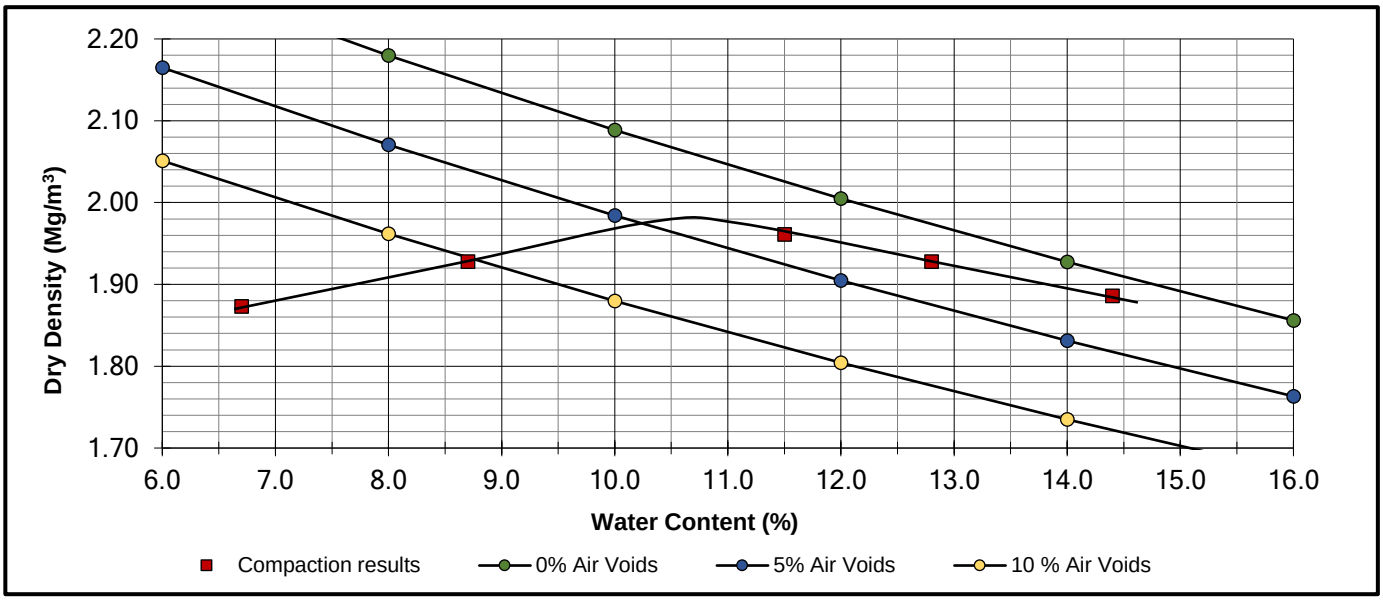
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-1	DATE SAMPLED	27-Oct-22
SAMPLE NUMBER	118515	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	2 %	PARTICLE DENSITY	2.64 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	6.7	1.873
2	8.7	1.928
3	11.5	1.961
4	12.8	1.928
5	14.4	1.886



OPTIMUM WATER CONTENT	**11**	(%)
MAXIMUM DRY DENSITY	**1.98**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

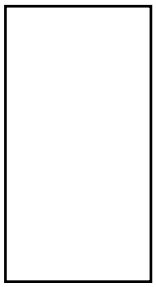
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-1	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118515	DATE RECEIVED	28-Oct-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.12	Mg/m3
DRY DENSITY	1.85	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.51	263.0	132

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

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TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

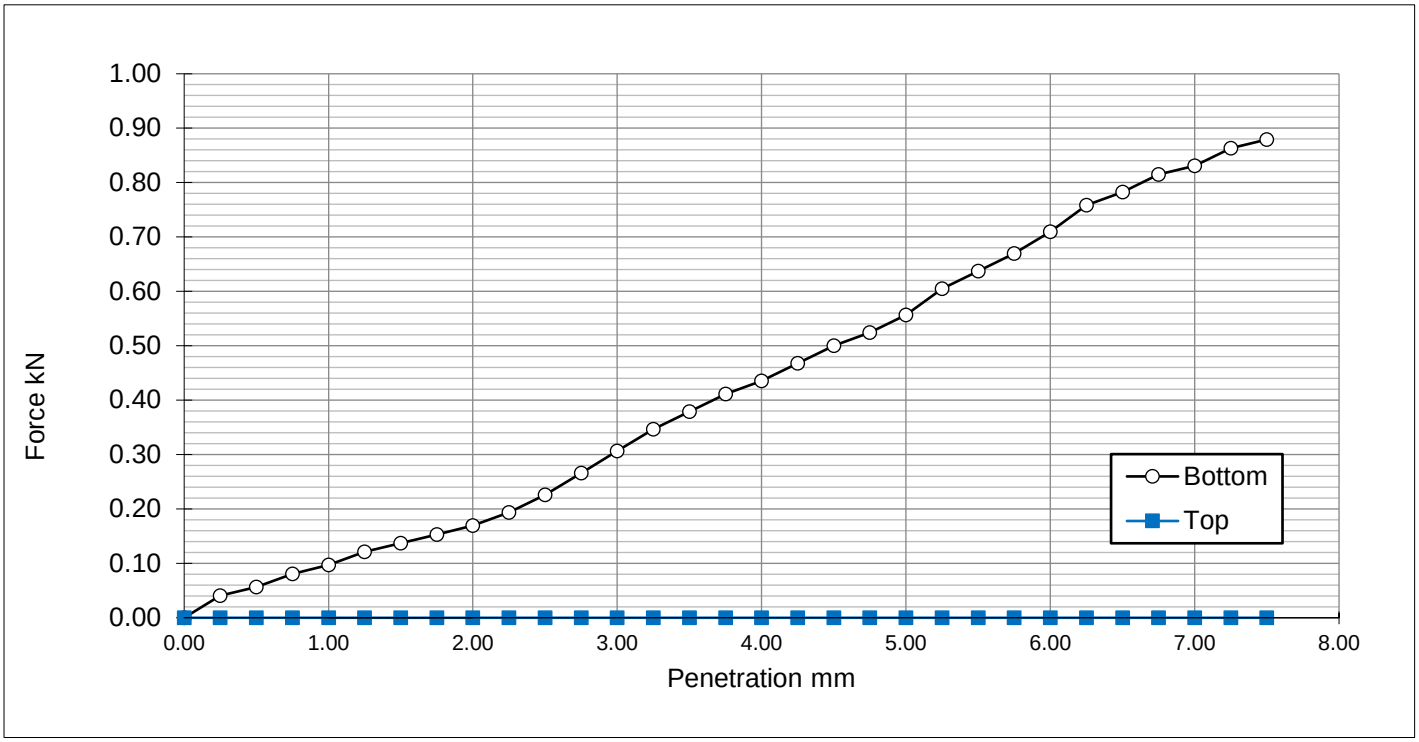
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-1	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118515	DATE RECEIVED	28-Oct-22
DATE TESTED	05-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		2 %			
BULK DENSITY	2.12 Mg/m3	MOISTURE CONTENT	15 %	DRY DENSITY	1.85 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	2.8	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	15	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

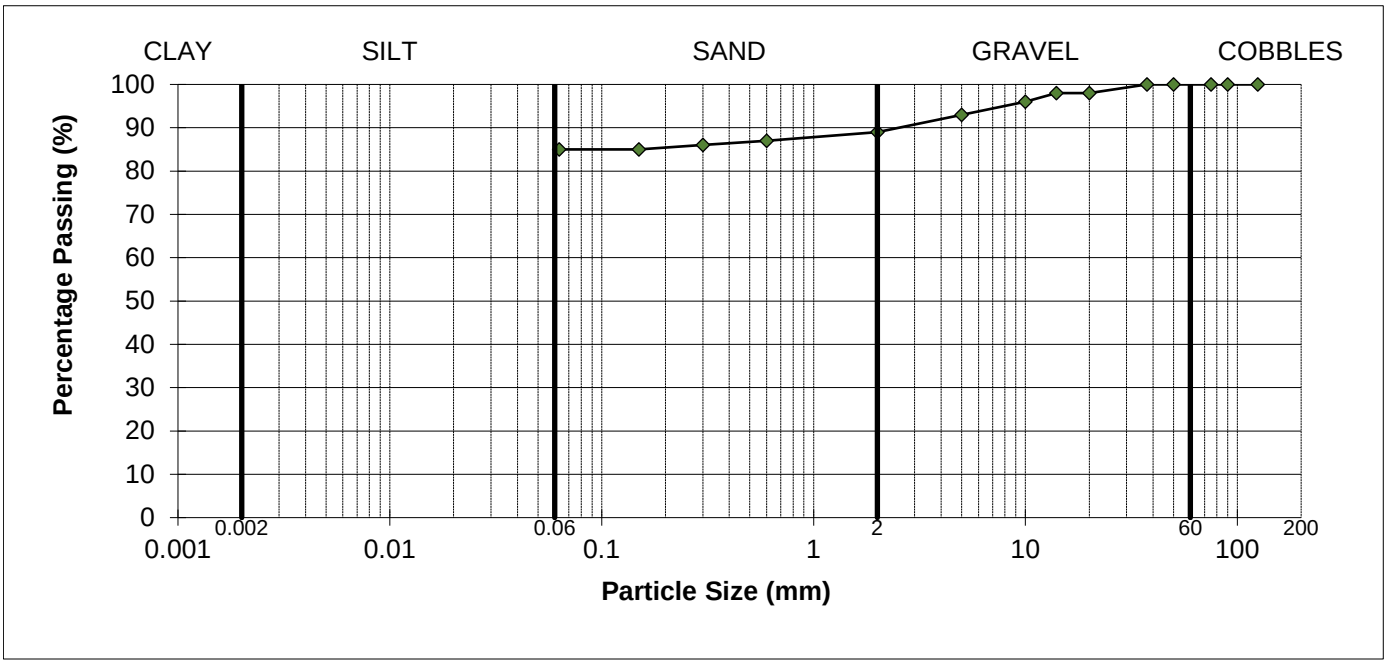
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-2	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118516	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	96	
90	100		5	93	
75	100		2	89	
50	100		0.6	87	
37.5	100		0.3	86	
20	98		0.15	85	
14	98		0.063	85	



REMARKS
As received moisture content = 14.4%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

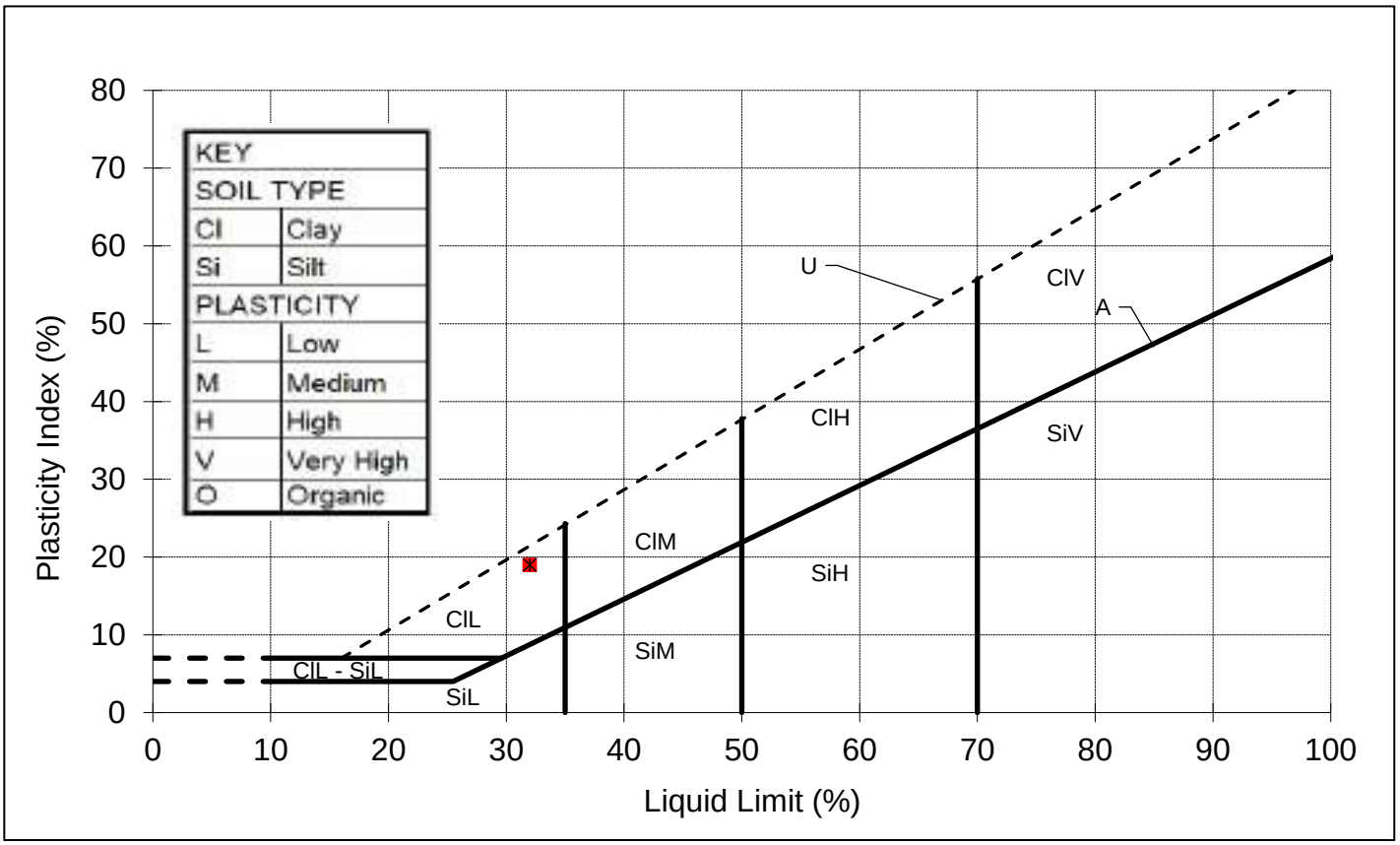
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-2	DATE SAMPLED	27-Oct-22
SAMPLE No.	118516	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14	32	13	19	87



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

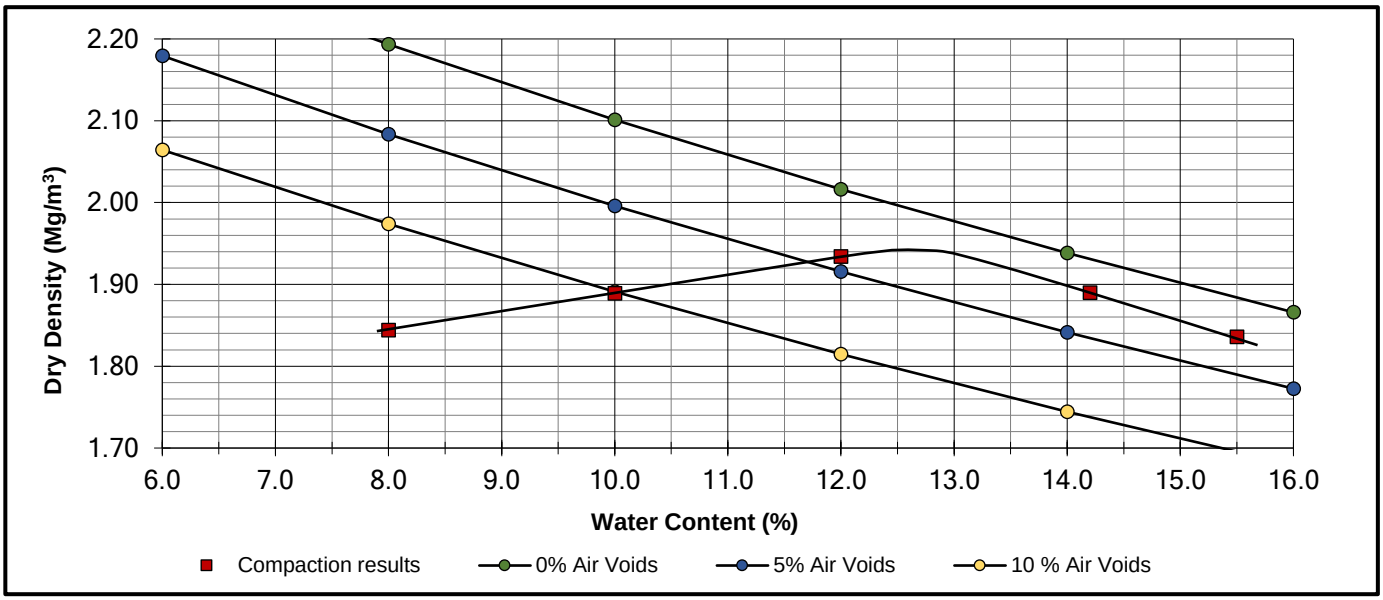
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-2	DATE SAMPLED	27-Oct-22
SAMPLE NUMBER	118516	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	2 %	PARTICLE DENSITY	2.66 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	8.0	1.844
2	10.0	1.889
3	12.0	1.934
4	14.2	1.890
5	15.5	1.836



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**1.94**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

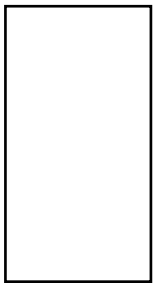
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-2	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118516	DATE RECEIVED	28-Oct-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	16	%
BULK DENSITY	2.09	Mg/m3
DRY DENSITY	1.81	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.51	295.2	148

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

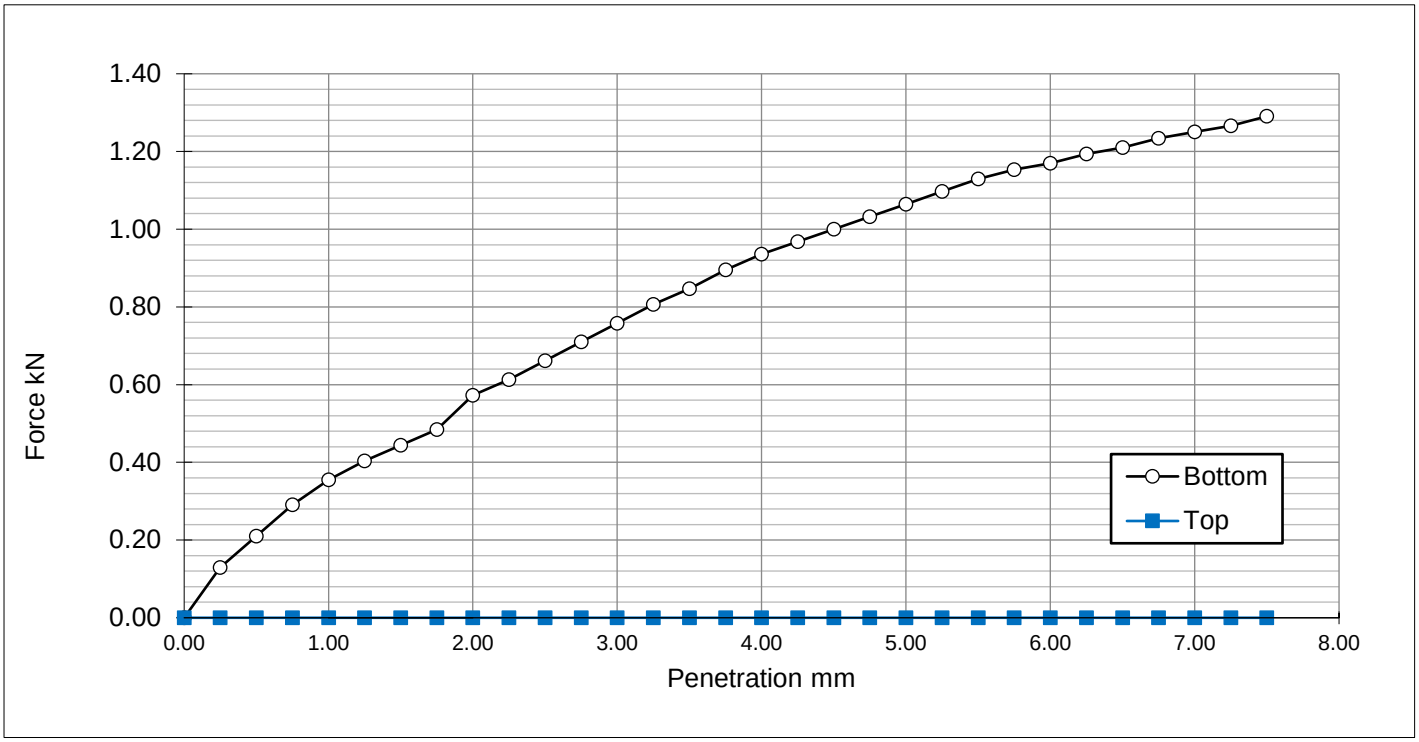
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-2	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118516	DATE RECEIVED	28-Oct-22
DATE TESTED	05-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		2 %			
BULK DENSITY	2.09 Mg/m3	MOISTURE CONTENT	16 %	DRY DENSITY	1.81 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	5.3	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	16	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

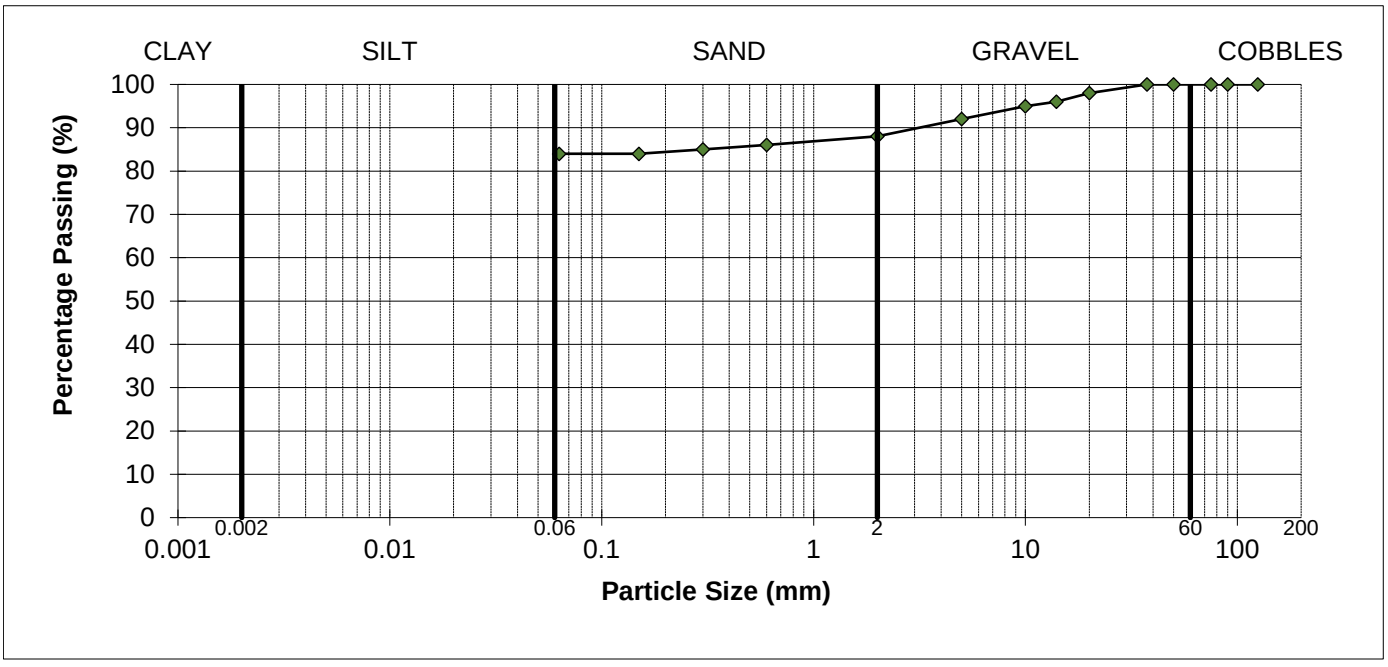
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-3	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118517	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	95	
90	100		5	92	
75	100		2	88	
50	100		0.6	86	
37.5	100		0.3	85	
20	98		0.15	84	
14	96		0.063	84	



REMARKS
As received moisture content = 9.8%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

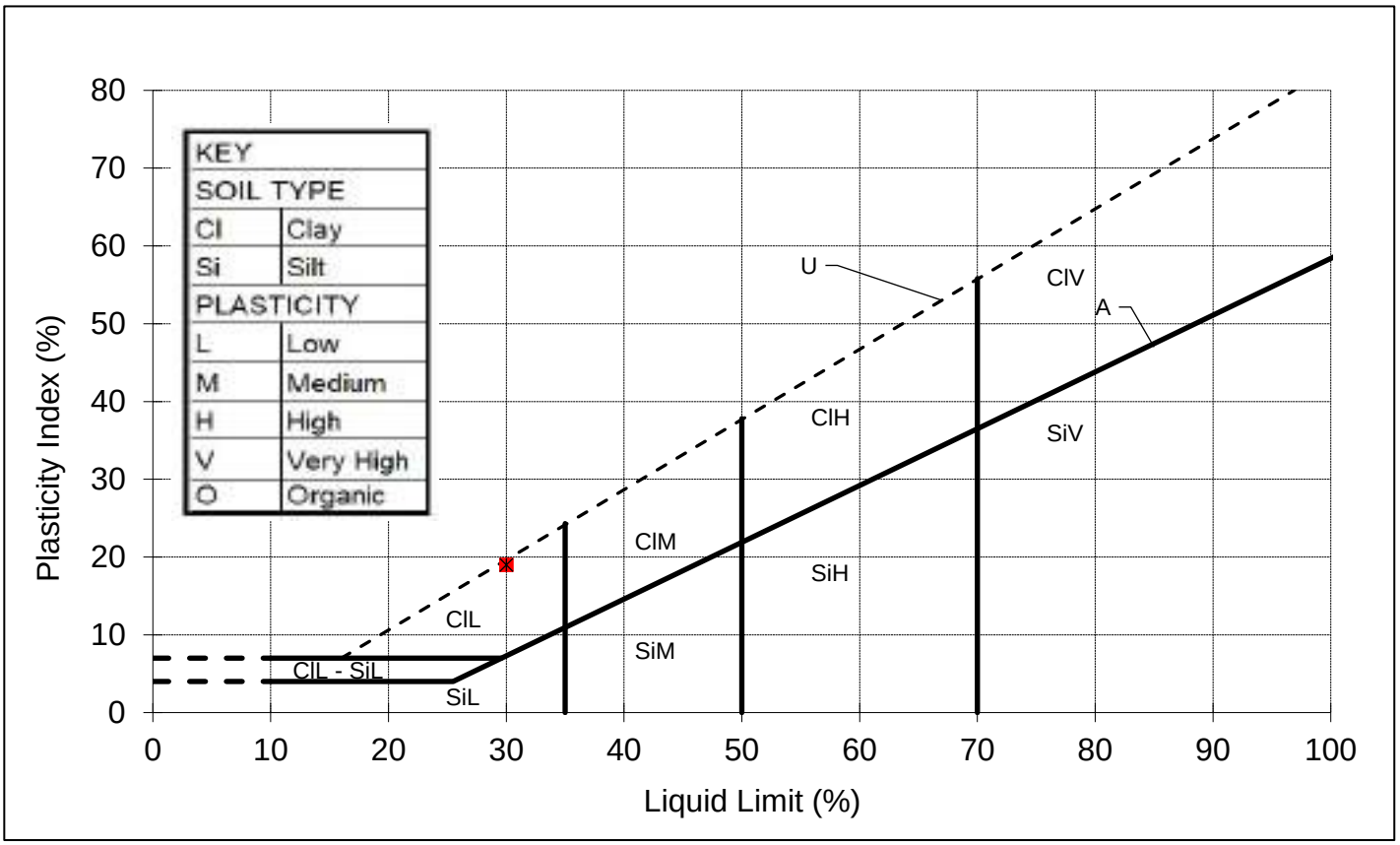
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-3	DATE SAMPLED	27-Oct-22
SAMPLE No.	118517	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
9.8	30	11	19	86



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

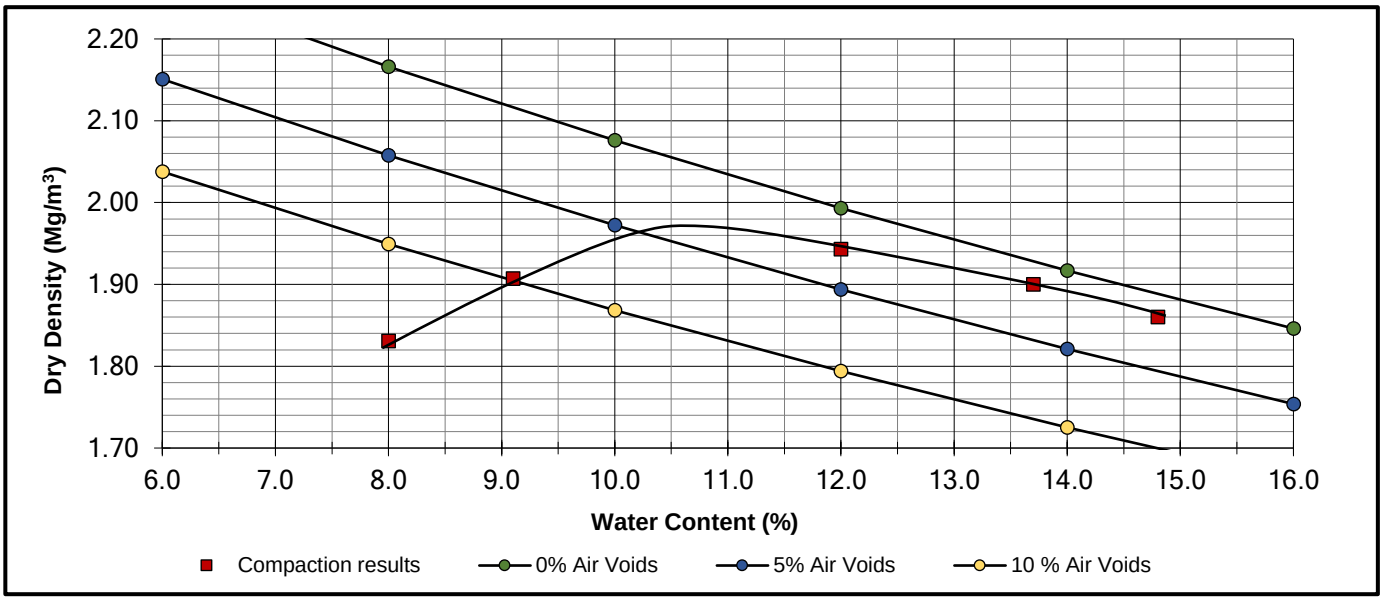
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-3	DATE SAMPLED	27-Oct-22
SAMPLE NUMBER	118517	DATE RECEIVED	28-Oct-22
DATE TESTED	25-Oct-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	2 %	PARTICLE DENSITY	2.62 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	8.0	1.831
2	9.1	1.907
3	12.0	1.943
4	13.7	1.900
5	14.8	1.860



OPTIMUM WATER CONTENT	**11**	(%)
MAXIMUM DRY DENSITY	**1.97**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

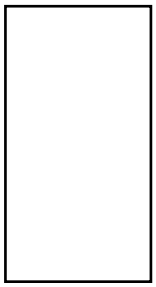
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-3	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118517	DATE RECEIVED	28-Oct-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.10	Mg/m3
DRY DENSITY	1.83	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.52	210.7	105

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 15-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

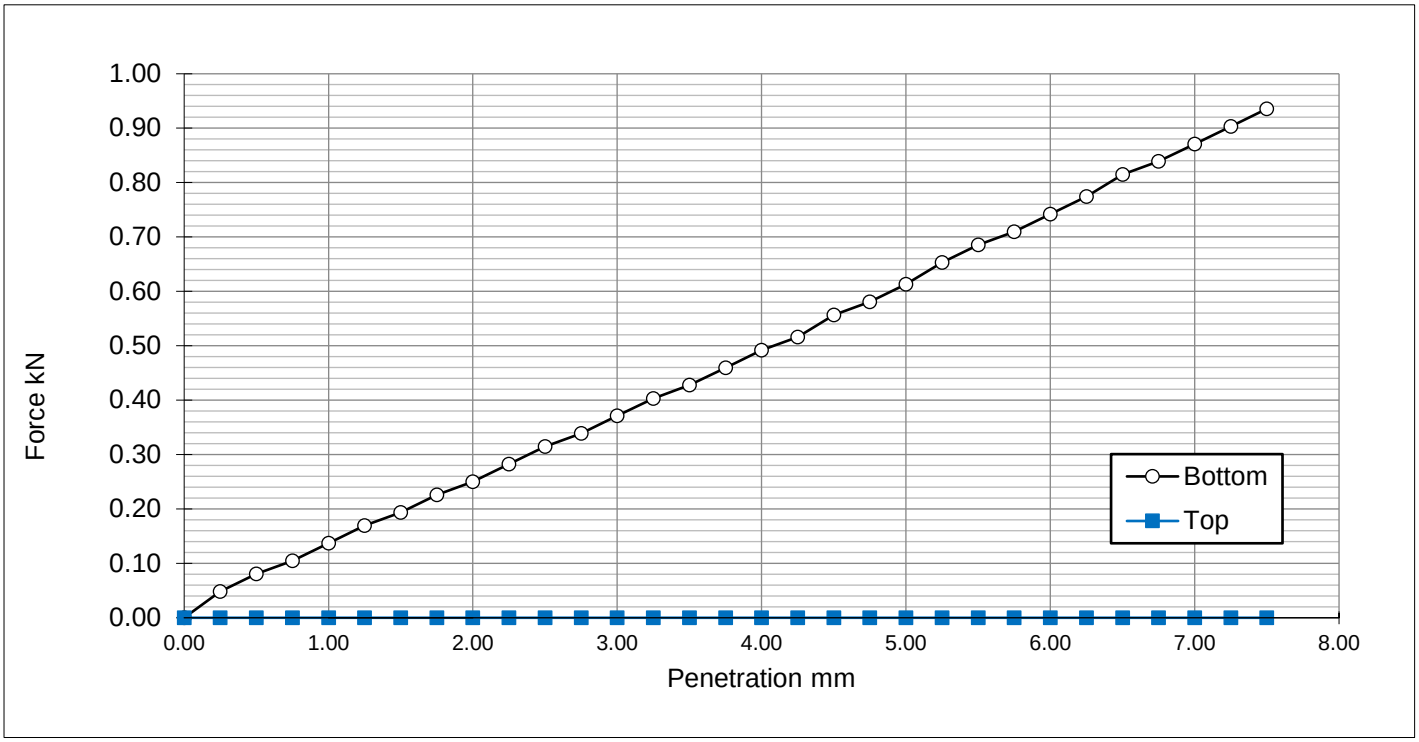
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/95

SAMPLE LABEL	POS-GC-3	DATE SAMPLED	27-Oct-22
LAB SAMPLE No	118517	DATE RECEIVED	28-Oct-22
DATE TESTED	05-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		2 %			
BULK DENSITY	2.10 Mg/m3	MOISTURE CONTENT	15 %	DRY DENSITY	1.83 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	3.1	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	15	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/96
Date of Issue 17 November 2022
Page 1 of 6

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/96		
TEST LOCATION	Test 01 - F7 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	16-Nov-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4737	4715	4680	4711	0.00	0.00	0.0
4581	4577	4522	4560	-1.51	3.00	10.6
4610	4613	4571	4598	-1.13	0.00	0.0
4594	4591	4535	4573	-1.37	2.00	7.1
4567	4570	4507	4548	-1.63	5.00	17.7
4548	4554	4481	4528	-1.83	8.00	28.3
4520	4524	4469	4504	-2.06	12.00	42.4
4509	4512	4443	4488	-2.23	15.00	53.1
4471	4476	4421	4456	-2.55	18.00	63.7
4520	4498	4464	4494	-2.17	0.00	0.0
4494	4474	4448	4472	-2.39	5.00	17.7
4477	4459	4419	4452	-2.59	9.00	31.8
4446	4432	4390	4423	-2.88	12.00	42.4
4419	4405	4358	4394	-3.17	15.00	53.1
4385	4379	4332	4365	-3.45	17.00	60.1
4344	4348	4300	4331	-3.80	20.00	70.7
4453	4439	4399	4430	-2.80	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	59	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.3	%
Surface Stiffness Modulus (E) =	51	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

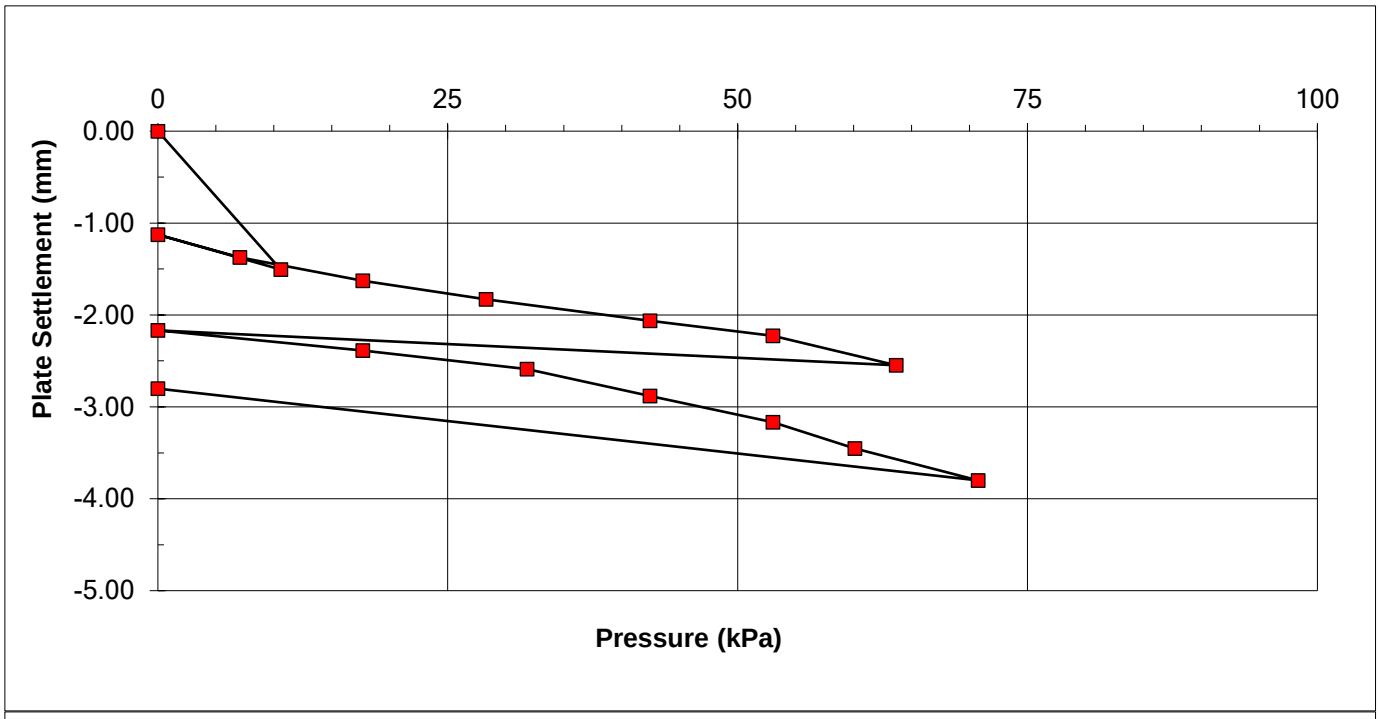
DATE 17-Nov-22

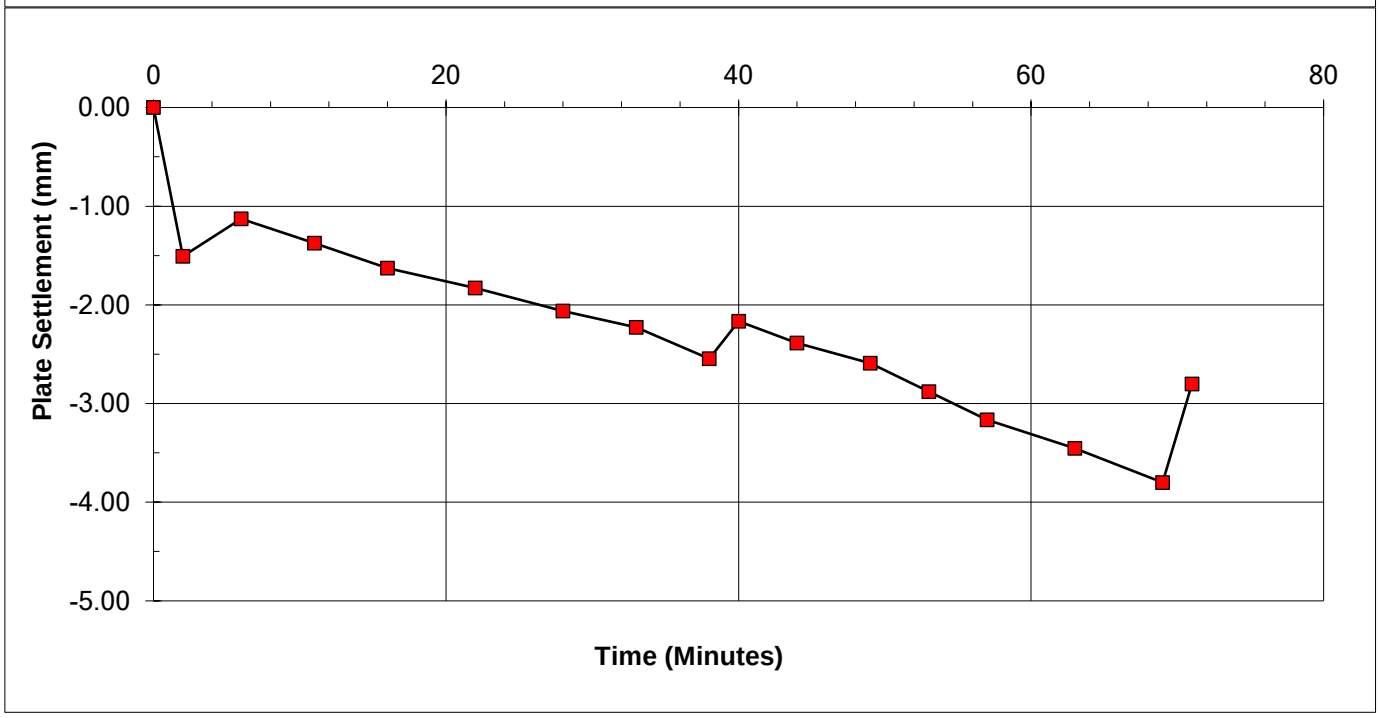
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 17-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP		
JOB NUMBER	MRN 4454/96		
TEST LOCATION	Test 02 - F9 L0	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	16-Nov-22	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4737	4715	4680	4711	0.00	0.00	0.0
4681	4577	4522	4593	-1.17	3.00	10.6
4710	4613	4571	4631	-0.79	0.00	0.0
4694	4591	4535	4607	-1.04	2.00	7.1
4667	4570	4507	4581	-1.29	5.00	17.7
4648	4554	4481	4561	-1.50	9.00	31.8
4620	4524	4469	4538	-1.73	13.00	46.0
4609	4512	4443	4521	-1.89	15.00	53.1
4571	4476	4421	4489	-2.21	18.00	63.7
4620	4498	4464	4527	-1.83	0.00	0.0
4590	4473	4440	4501	-2.10	2.00	7.1
4566	4453	4421	4480	-2.31	5.00	17.7
4546	4438	4409	4464	-2.46	9.00	31.8
4527	4420	4374	4440	-2.70	12.00	42.4
4495	4397	4358	4417	-2.94	16.00	56.6
4453	4354	4316	4374	-3.36	19.00	67.2
4518	4432	4366	4439	-2.72	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	60	kPa
Modulus of subgrade reaction (k) =	48	MPa/m
Equivalent 762 mm plate reaction =	39	MPa/m
Equivalent CBR =	5.4	%
Surface Stiffness Modulus (E) =	52	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 17-Nov-22

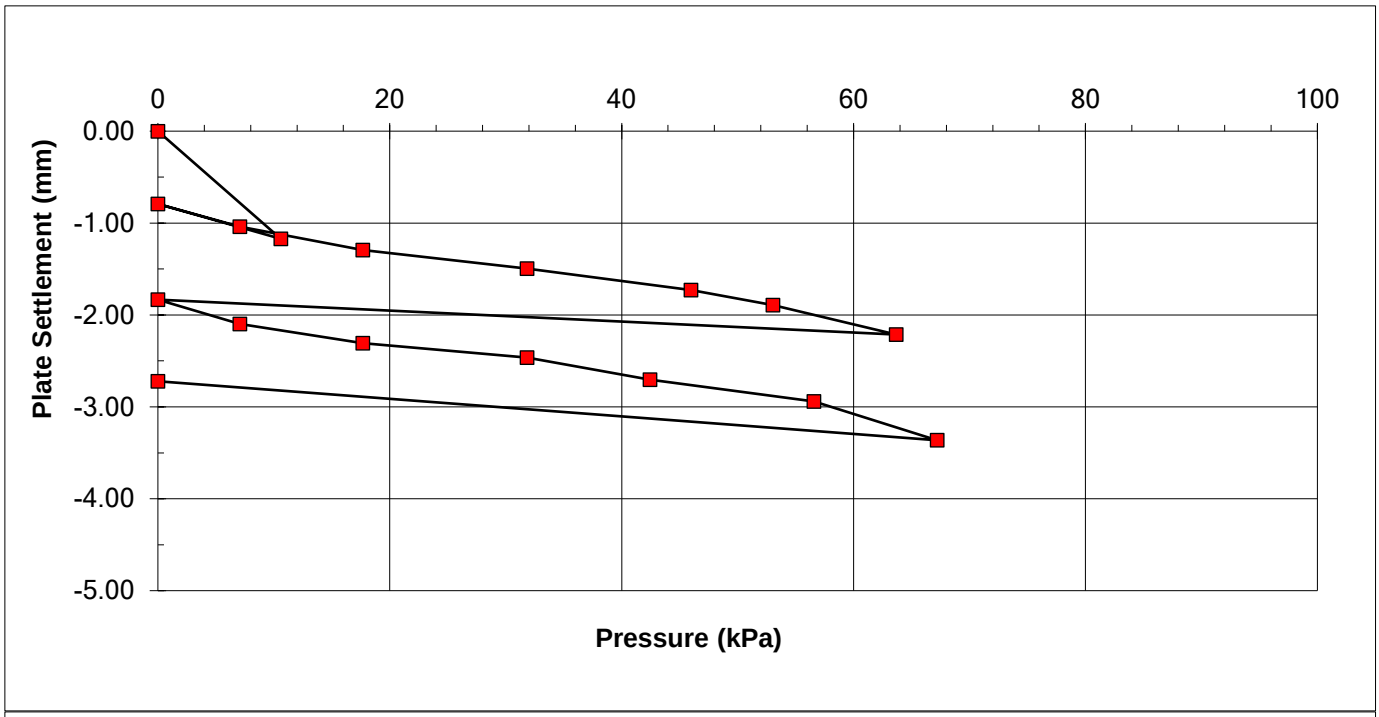
MURRAY RIX

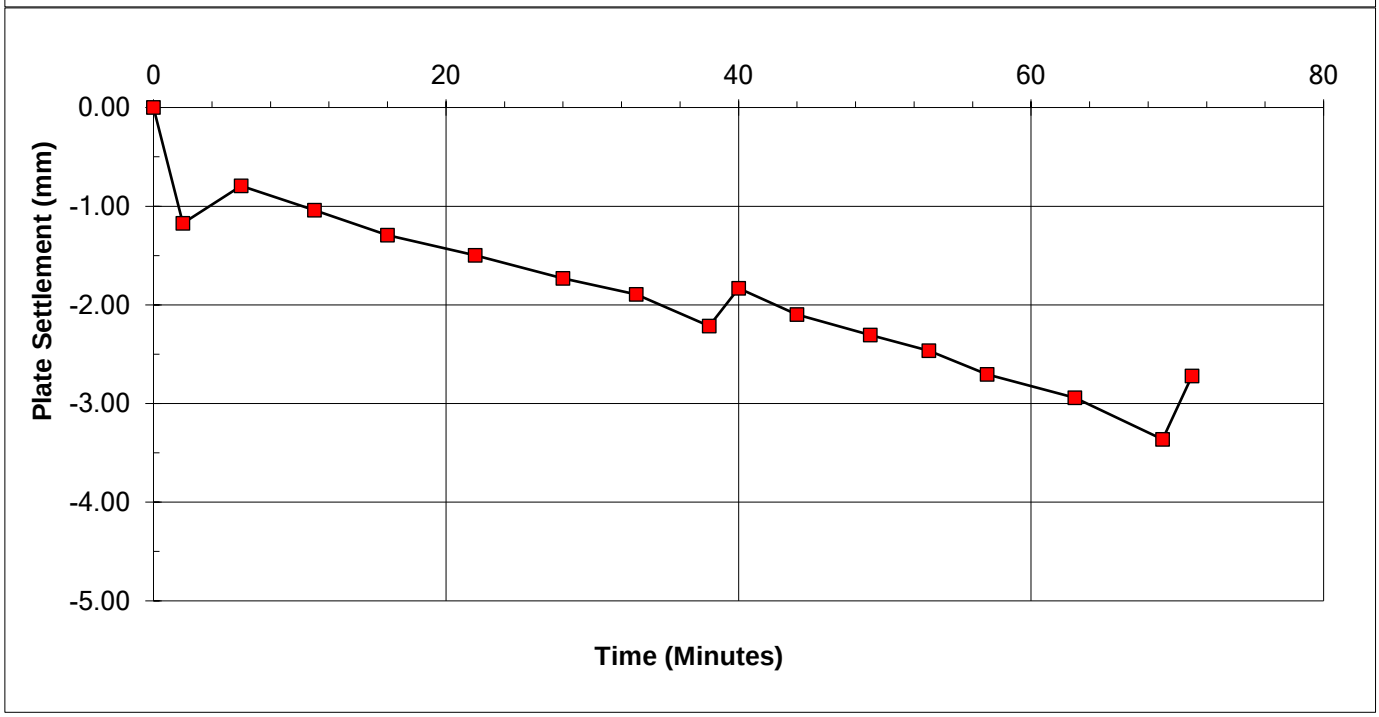
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 17-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	16-Nov-22	**JOB NUMBER**	MRN 4454/96
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	H11 L1	225	1.71	1.42	20	96.3	2.7
2	H11 L1	225	1.72	1.44	19	97.3	2.9
3	H11 L3	225	1.74	1.44	21	97.0	0.3
4	H11 L4	225	1.75	1.45	21	97.8	0.5
5	H12 L1	225	1.78	1.51	17	102.3	1.0
6	H12 L2	225	1.78	1.53	16	103.4	1.7
7	H12 L3	225	1.77	1.54	15	104.0	3.2
8	H12 L4	225	1.74	1.49	17	100.7	3.7
9	H13 L1	225	1.70	1.51	12	102.3	8.9
10	H13 L2	225	1.71	1.51	13	102.1	7.3
11	H13 L3	225	1.73	1.54	13	103.7	6.9
12	H13 L4	225	1.75	1.55	13	104.7	5.3
13	I11 L1	225	1.73	1.47	17	99.4	3.9
14	I11 L2	225	1.73	1.46	18	98.9	2.8
15	I11 L3	225	1.73	1.45	19	98.2	2.1
16	I11 L4	225	1.72	1.44	19	97.6	2.6
17	I12 L1	225	1.76	1.49	18	101.0	1.5
18	I12 L2	225	1.78	1.53	16	103.5	1.5
19	I12 L3	225	1.78	1.53	17	103.2	1.3
20	I12 L4	225	1.71	1.46	17	98.4	5.0
				Maximum Dry Density (Mg/m3)	1.48	(Advised by client)	
				Particle Density (Mg/m3)	2.08	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 17-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	16-Nov-22	**JOB NUMBER**	MRN 4454/96
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	I13 L1	225	1.70	1.49	14	100.7	7.4
2	I13 L2	225	1.68	1.47	14	99.4	8.2
3	I13 L3	225	1.68	1.49	13	100.6	9.3
4	I13 L4	225	1.67	1.47	14	99.5	9.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
					Maximum Dry Density (Mg/m3)	1.48	(Advised by client)
					Particle Density (Mg/m3)	2.08	(Advised by client)
					Results correct for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 17-Nov-22

MURRAY RIX

CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/97
Date of Issue 21 November 2022
Page 1 of 25

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

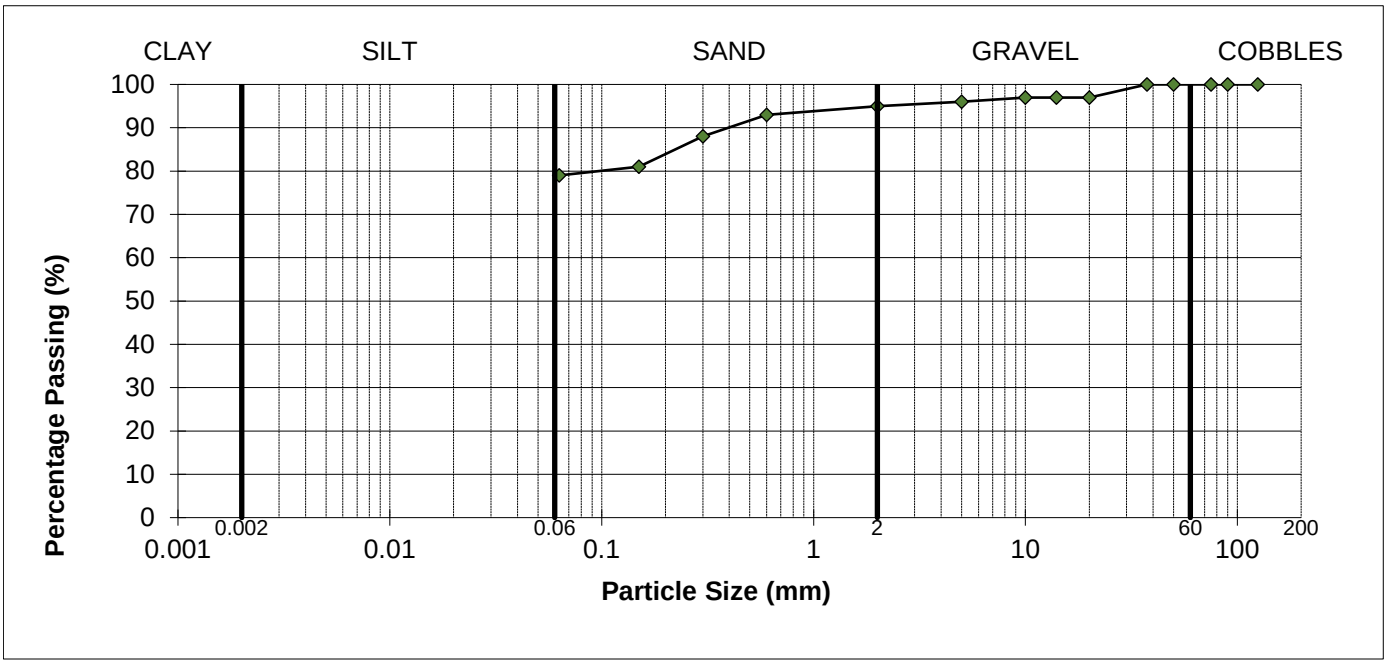
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, E3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118605	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	97	
90	100		5	96	
75	100		2	95	
50	100		0.6	93	
37.5	100		0.3	88	
20	97		0.15	81	
14	97		0.063	79	



REMARKS
As received moisture content = 20%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

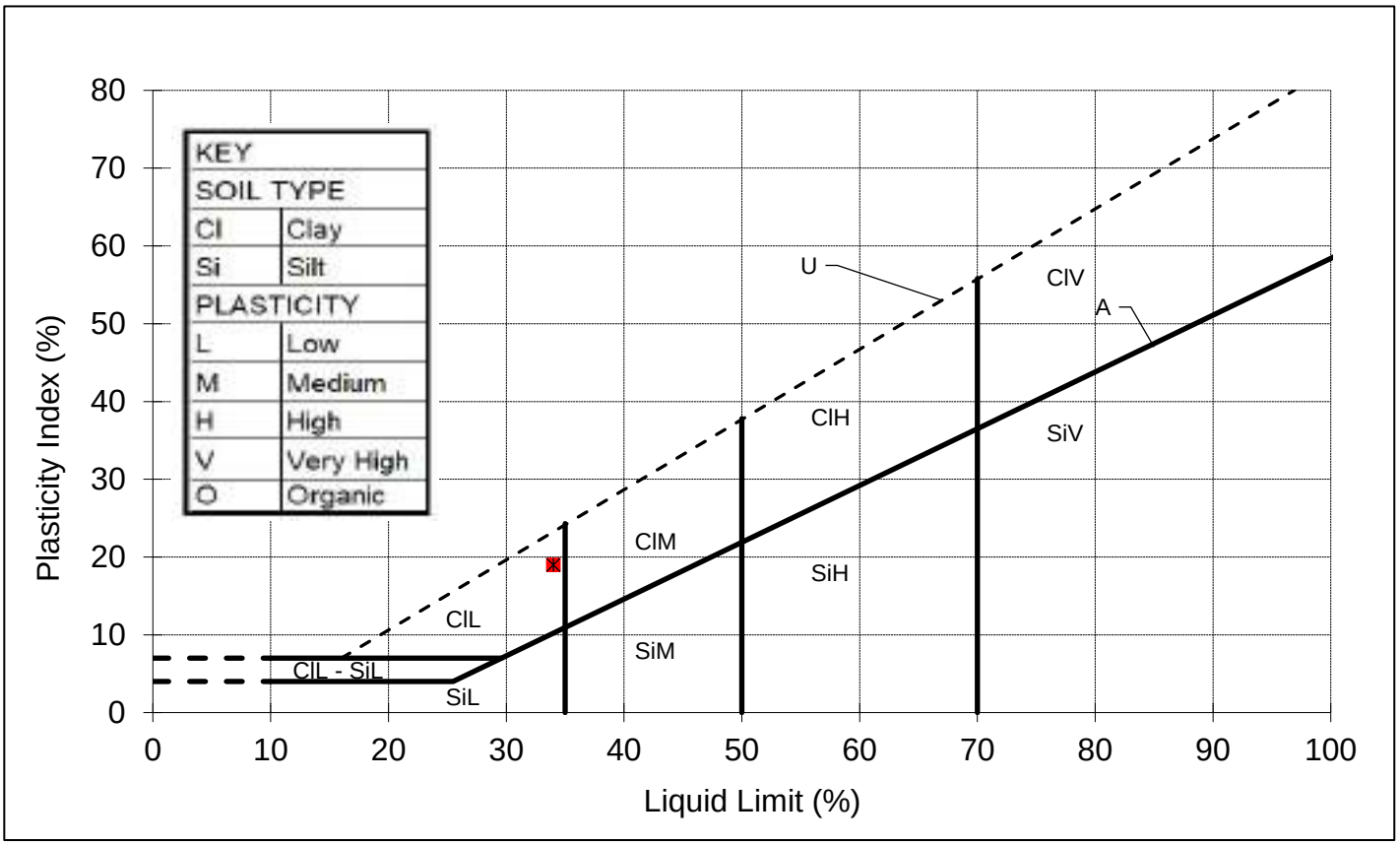
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, E3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
SAMPLE No.	118605	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20	34	15	19	91



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

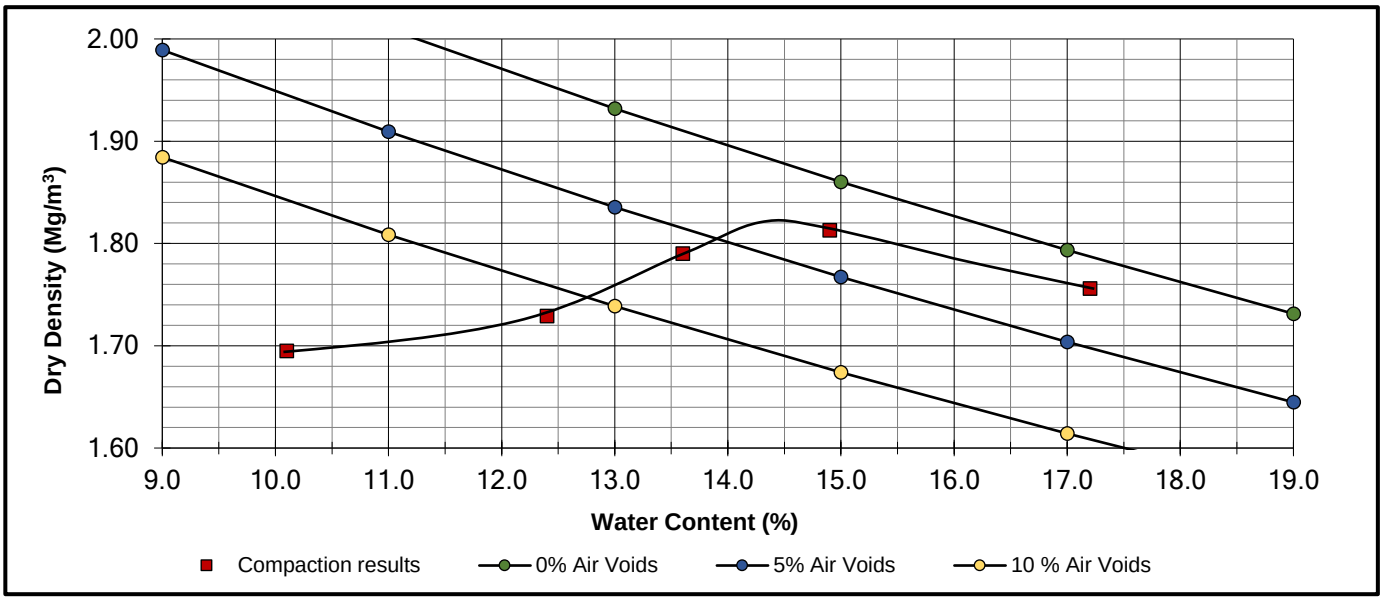
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, E3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
SAMPLE NUMBER	118605	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	3 %	PARTICLE DENSITY	2.58 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	10.1	1.695
2	12.4	1.729
3	13.6	1.790
4	14.9	1.813
5	17.2	1.756



OPTIMUM WATER CONTENT	**14**	(%)
MAXIMUM DRY DENSITY	**1.82**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

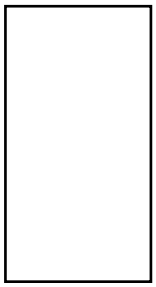
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, E3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118605	DATE RECEIVED	02-Nov-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	20	%
BULK DENSITY	1.93	Mg/m3
DRY DENSITY	1.60	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.51	125.1	63

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

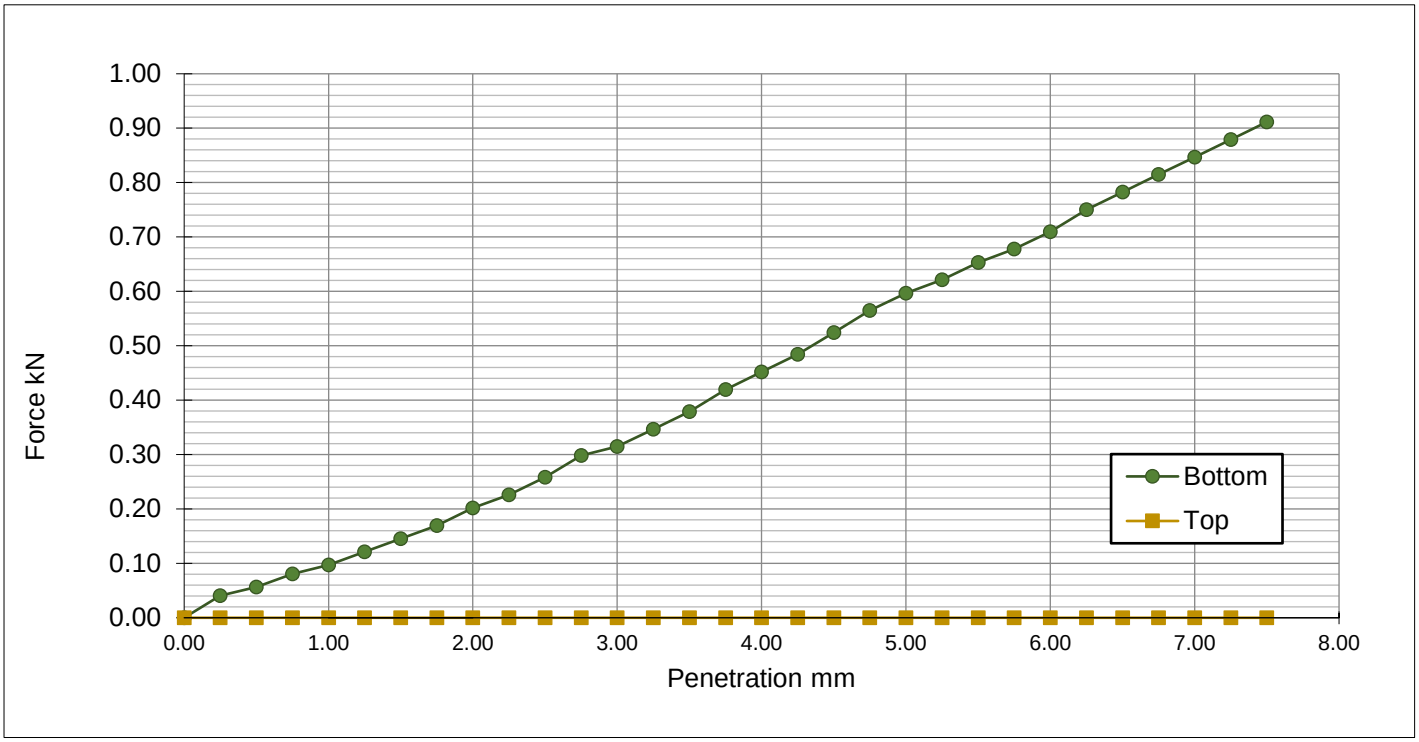
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, E3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118605	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		3 %			
BULK DENSITY	1.93 Mg/m3	MOISTURE CONTENT	20 %	DRY DENSITY	1.60 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	3.0	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	20	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

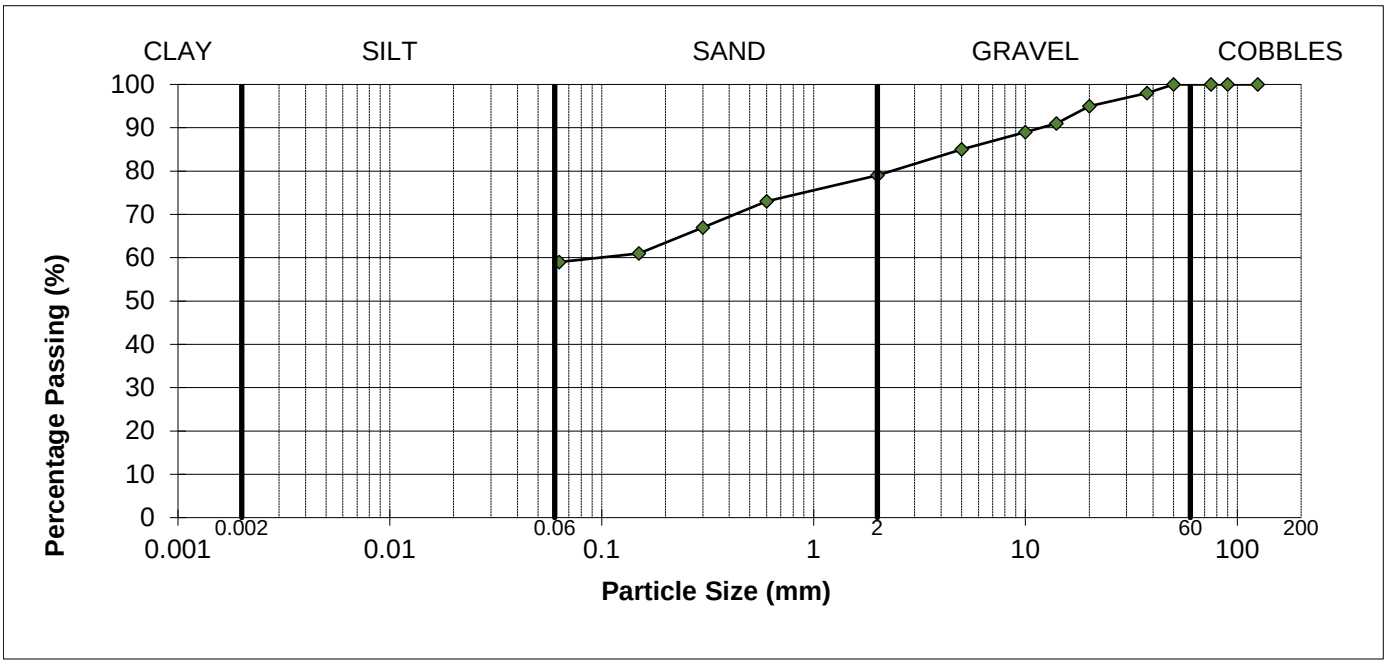
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, E3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118606	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	89	
90	100		5	85	
75	100		2	79	
50	100		0.6	73	
37.5	98		0.3	67	
20	95		0.15	61	
14	91		0.063	59	



REMARKS
As received moisture content = 13%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

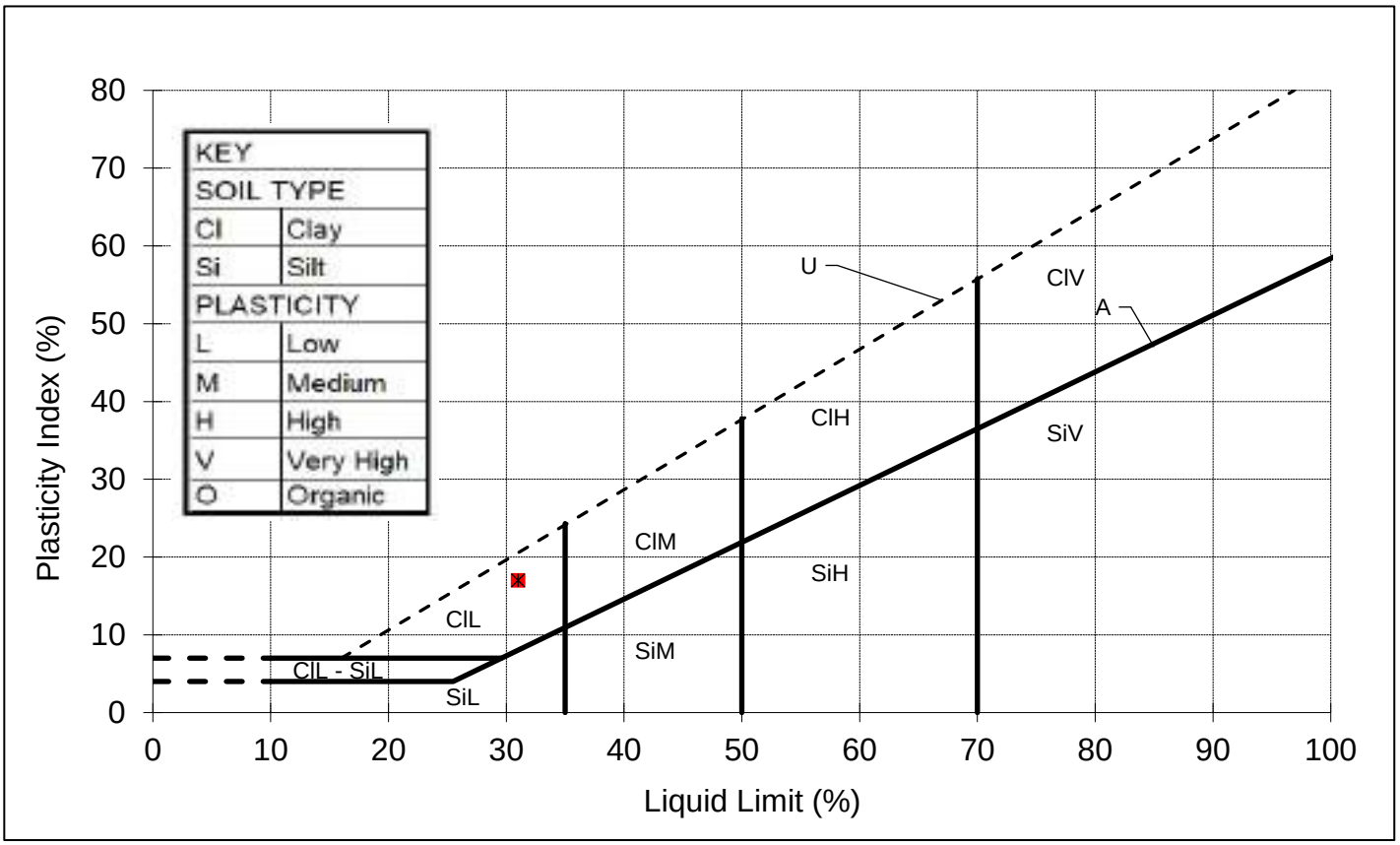
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, E3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
SAMPLE No.	118606	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
13	31	14	17	71



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

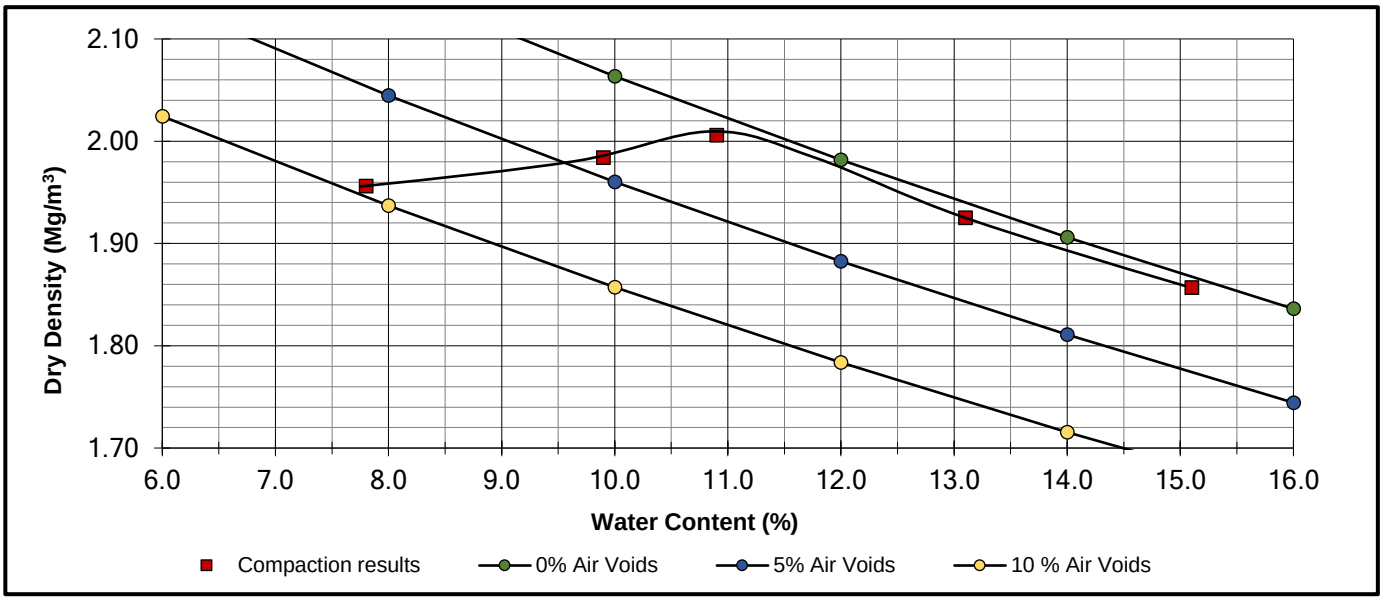
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, E3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
SAMPLE NUMBER	118606	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	2	%	GRADING ZONE	Zone 4	
RETAINED 20mm	5	%	PARTICLE DENSITY	2.60 Mg/m3	(Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	7.8	1.956
2	9.9	1.984
3	10.9	2.006
4	13.1	1.925
5	15.1	1.857



OPTIMUM WATER CONTENT	**11**	(%)
MAXIMUM DRY DENSITY	**2.01**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

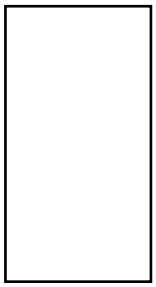
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, E3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118606	DATE RECEIVED	02-Nov-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	13	%
BULK DENSITY	2.17	Mg/m3
DRY DENSITY	1.91	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.43	383.0	192

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

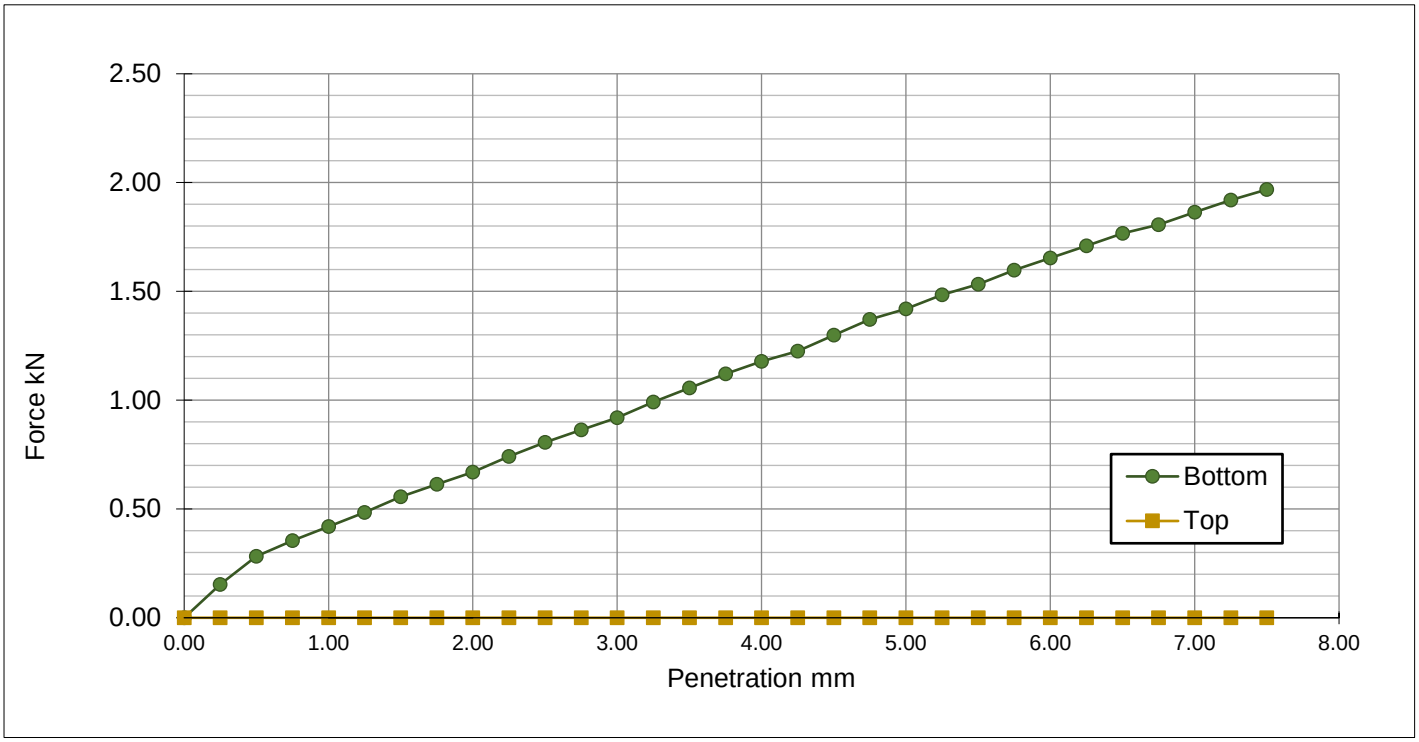
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2.0m, E3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118606	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		5 %			
BULK DENSITY	2.17 Mg/m3	MOISTURE CONTENT	13 %	DRY DENSITY	1.91 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	7.1	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	13	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

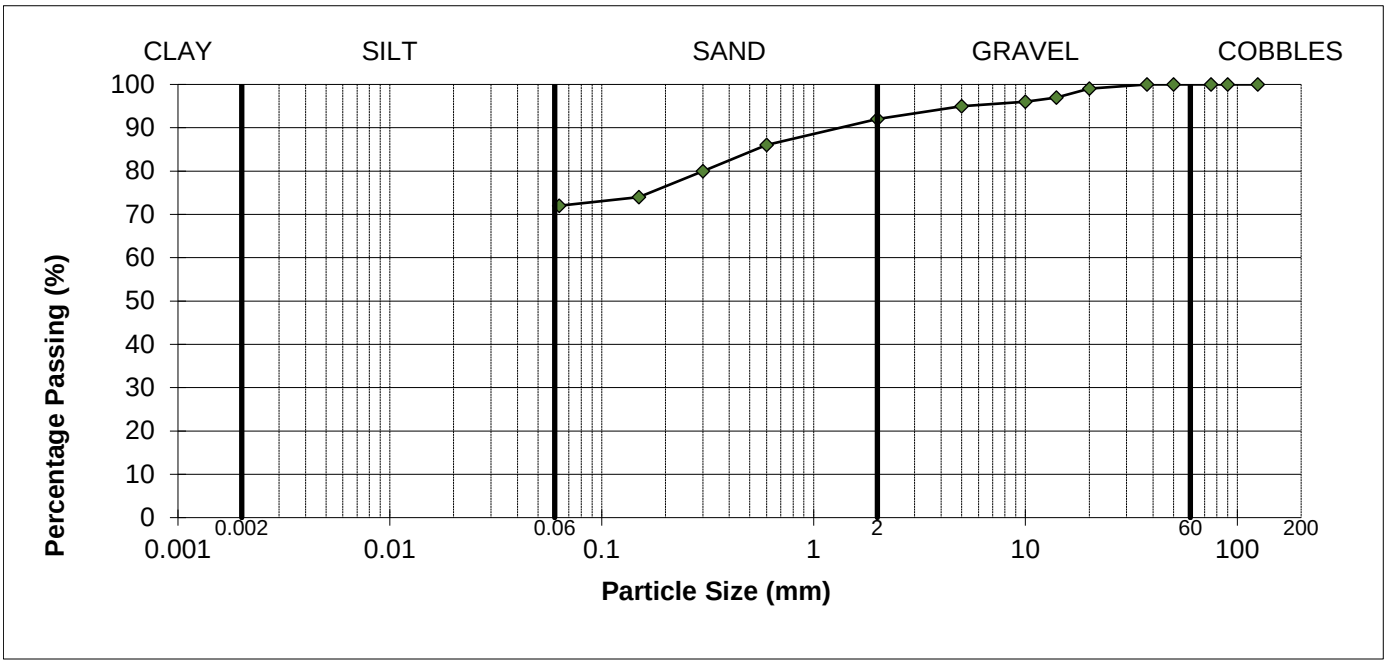
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, G/H3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118607	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	96	
90	100		5	95	
75	100		2	92	
50	100		0.6	86	
37.5	100		0.3	80	
20	99		0.15	74	
14	97		0.063	72	



REMARKS
As received moisture content = 26%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

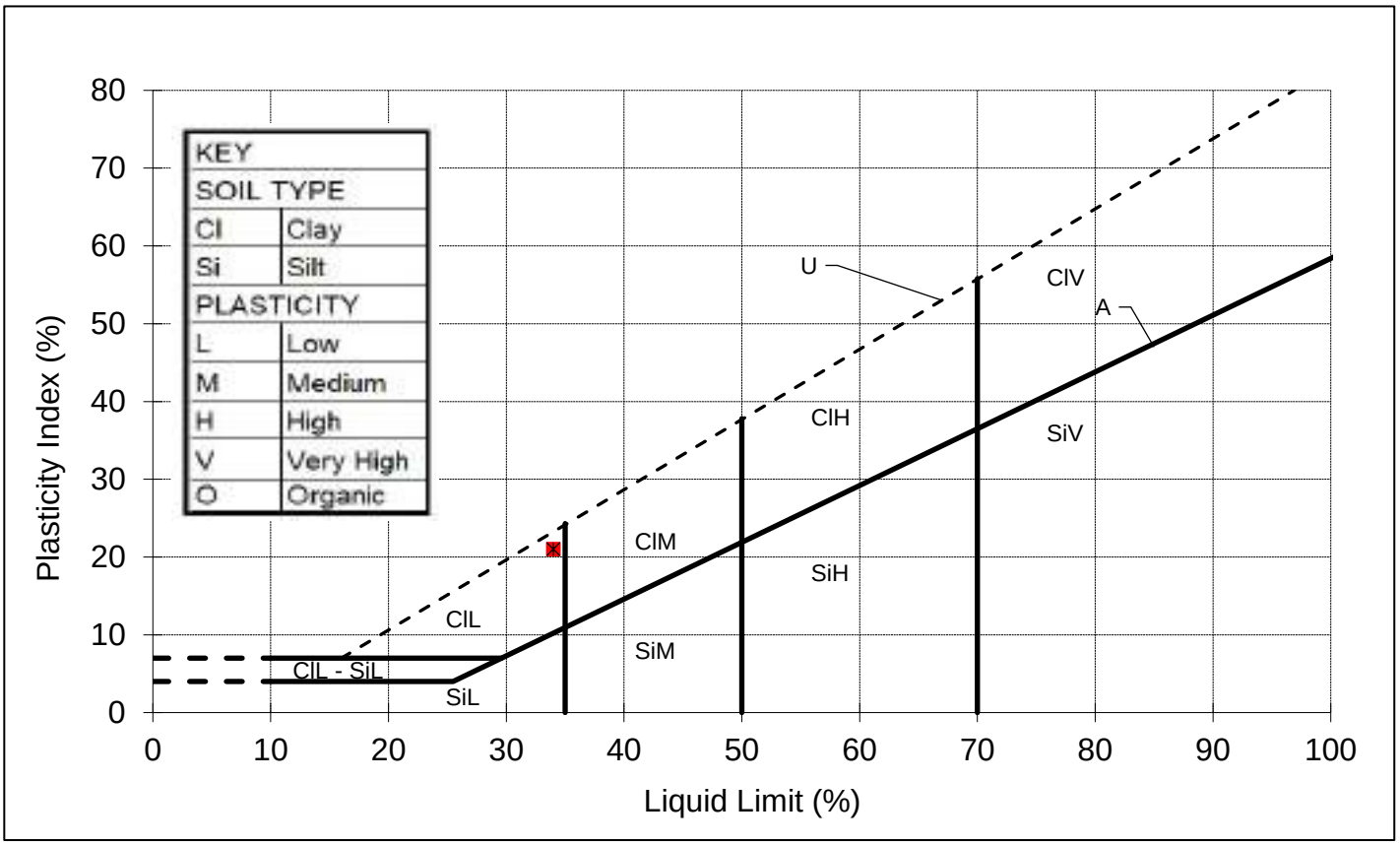
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, G/H3 - Yellow-Brown Cla	DATE SAMPLED	02-Nov-22
SAMPLE No.	118607	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
26	34	13	21	84



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

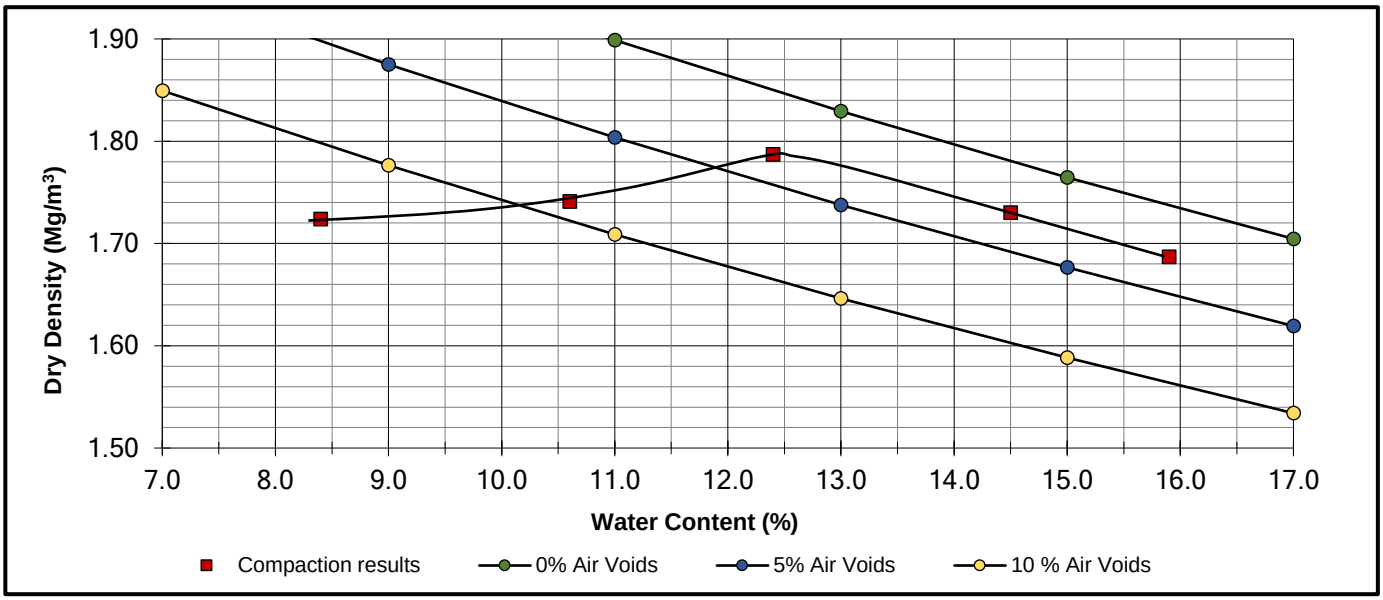
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, G/H3 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
SAMPLE NUMBER	118607	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	1 %	PARTICLE DENSITY	2.40 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	8.4	1.724
2	10.6	1.741
3	12.4	1.787
4	14.5	1.730
5	15.9	1.687



OPTIMUM WATER CONTENT	**12**	(%)
MAXIMUM DRY DENSITY	**1.79**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

SIGNED

DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

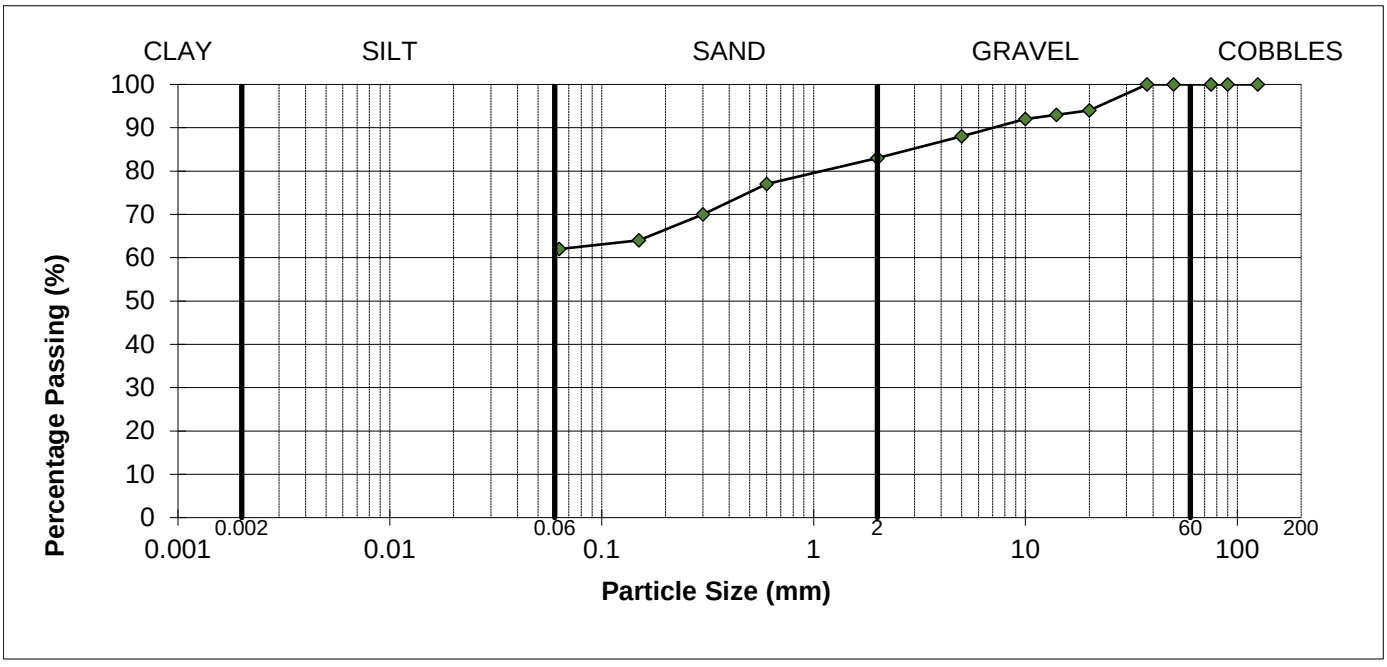
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, G/H3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118608	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	92	
90	100		5	88	
75	100		2	83	
50	100		0.6	77	
37.5	100		0.3	70	
20	94		0.15	64	
14	93		0.063	62	



REMARKS
As received moisture content = 16%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

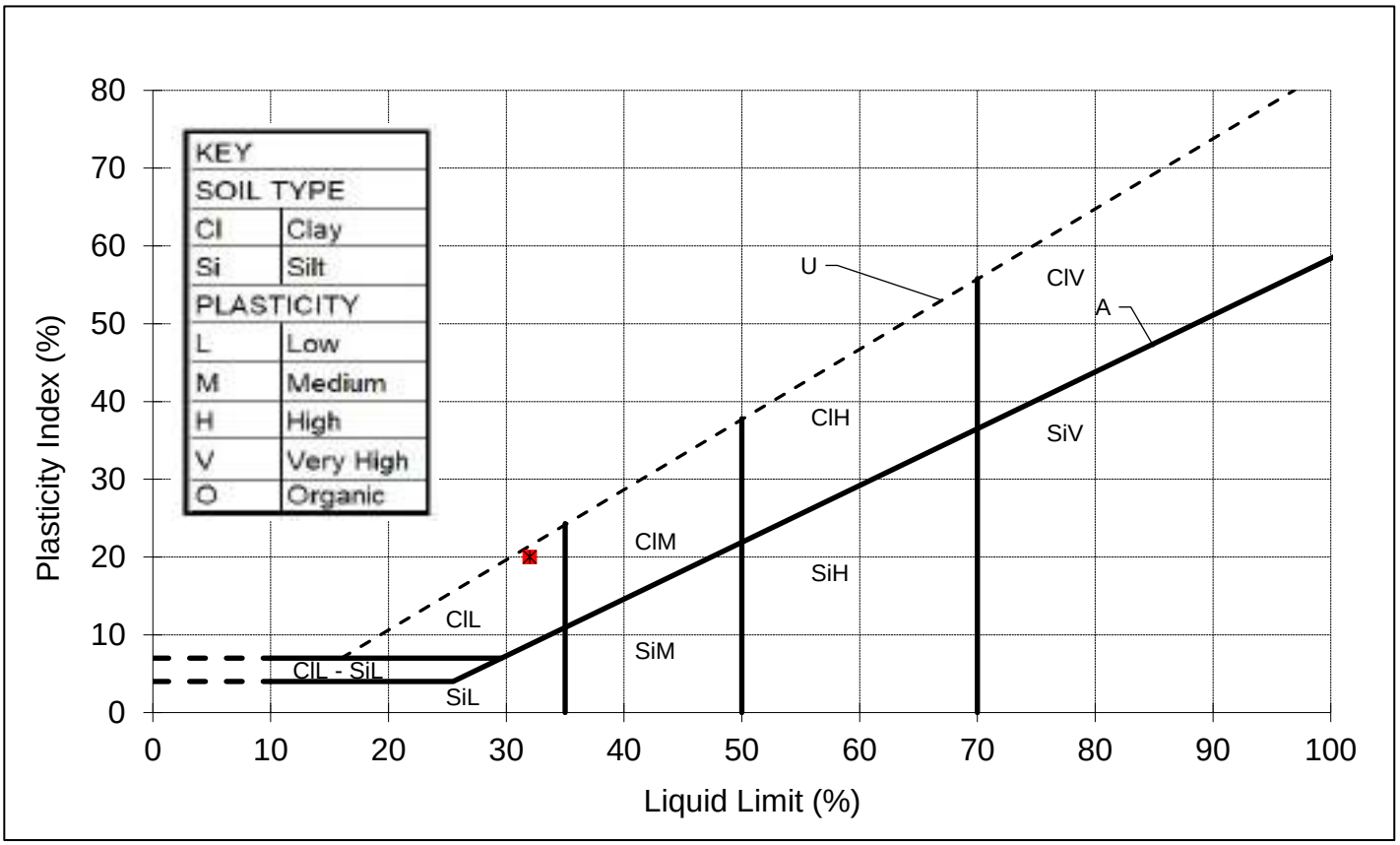
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, G/H3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
SAMPLE No.	118608	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
13	32	12	20	74



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

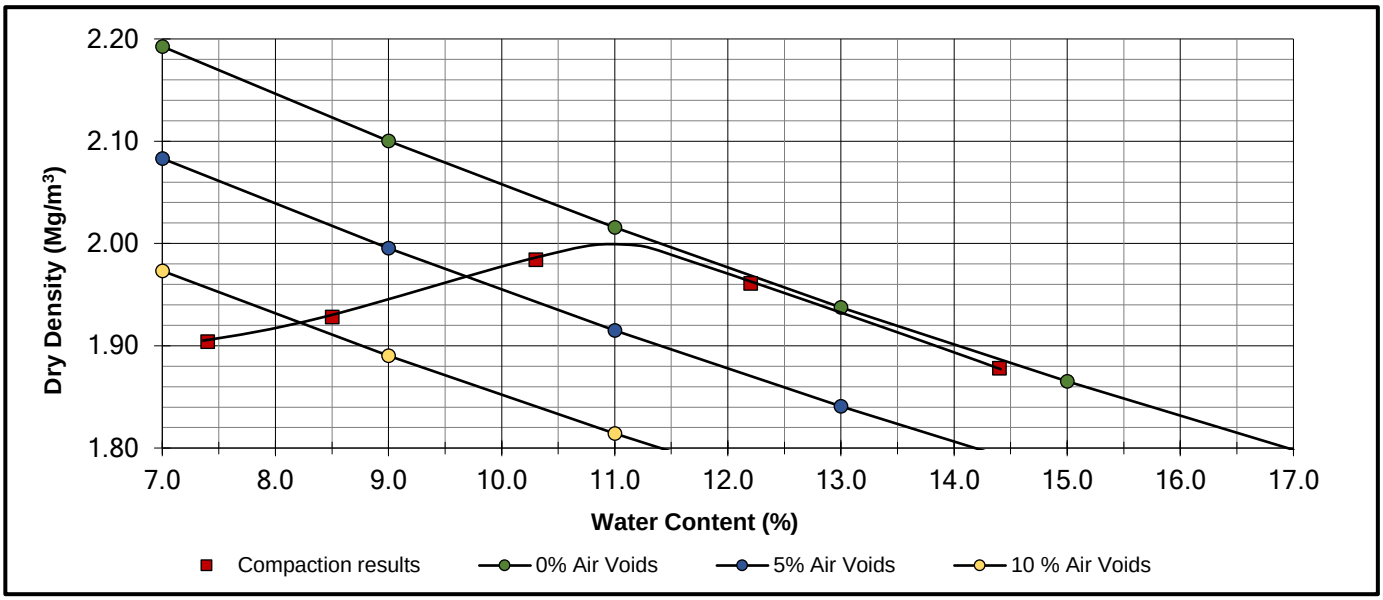
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2m, G/H3 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
SAMPLE NUMBER	118608	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	6 %	PARTICLE DENSITY	2.59 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	7.4	1.904
2	8.5	1.928
3	10.3	1.984
4	12.2	1.961
5	14.4	1.878



OPTIMUM WATER CONTENT	**11**	(%)
MAXIMUM DRY DENSITY	**2.00**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

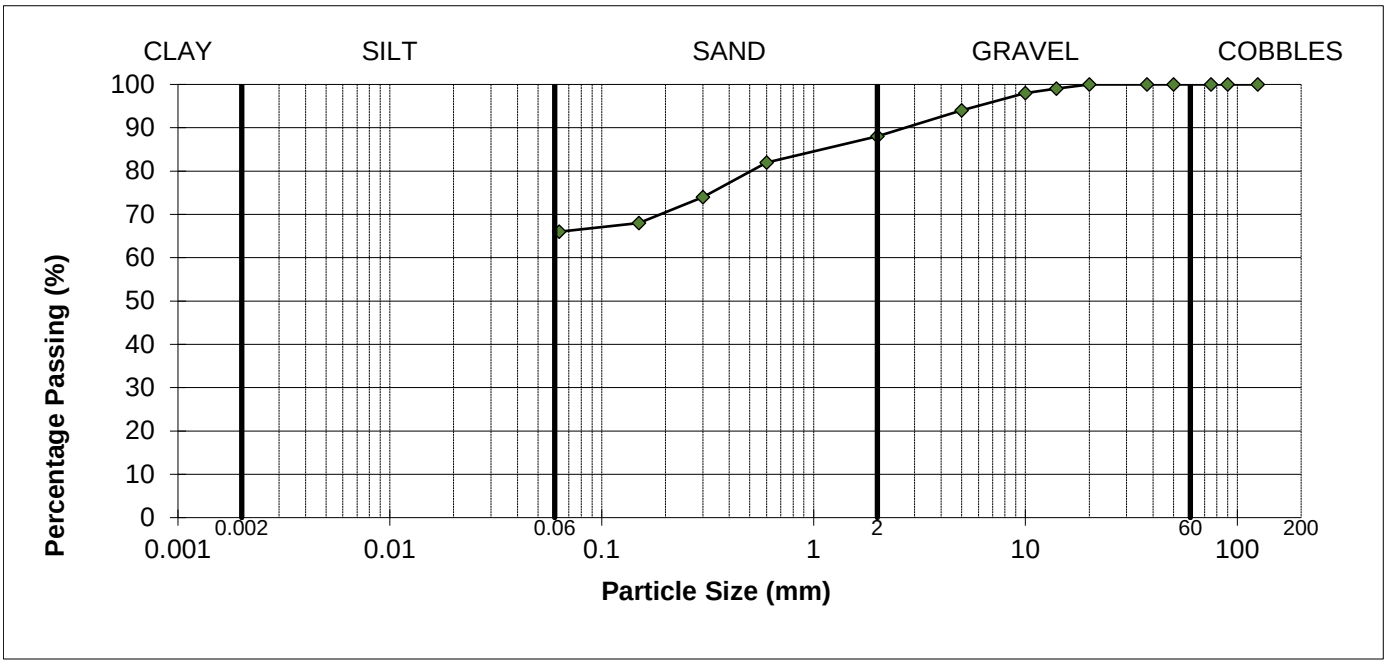
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, H4 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118609	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	98	
90	100		5	94	
75	100		2	88	
50	100		0.6	82	
37.5	100		0.3	74	
20	100		0.15	68	
14	99		0.063	66	



REMARKS
As received moisture content = 16%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

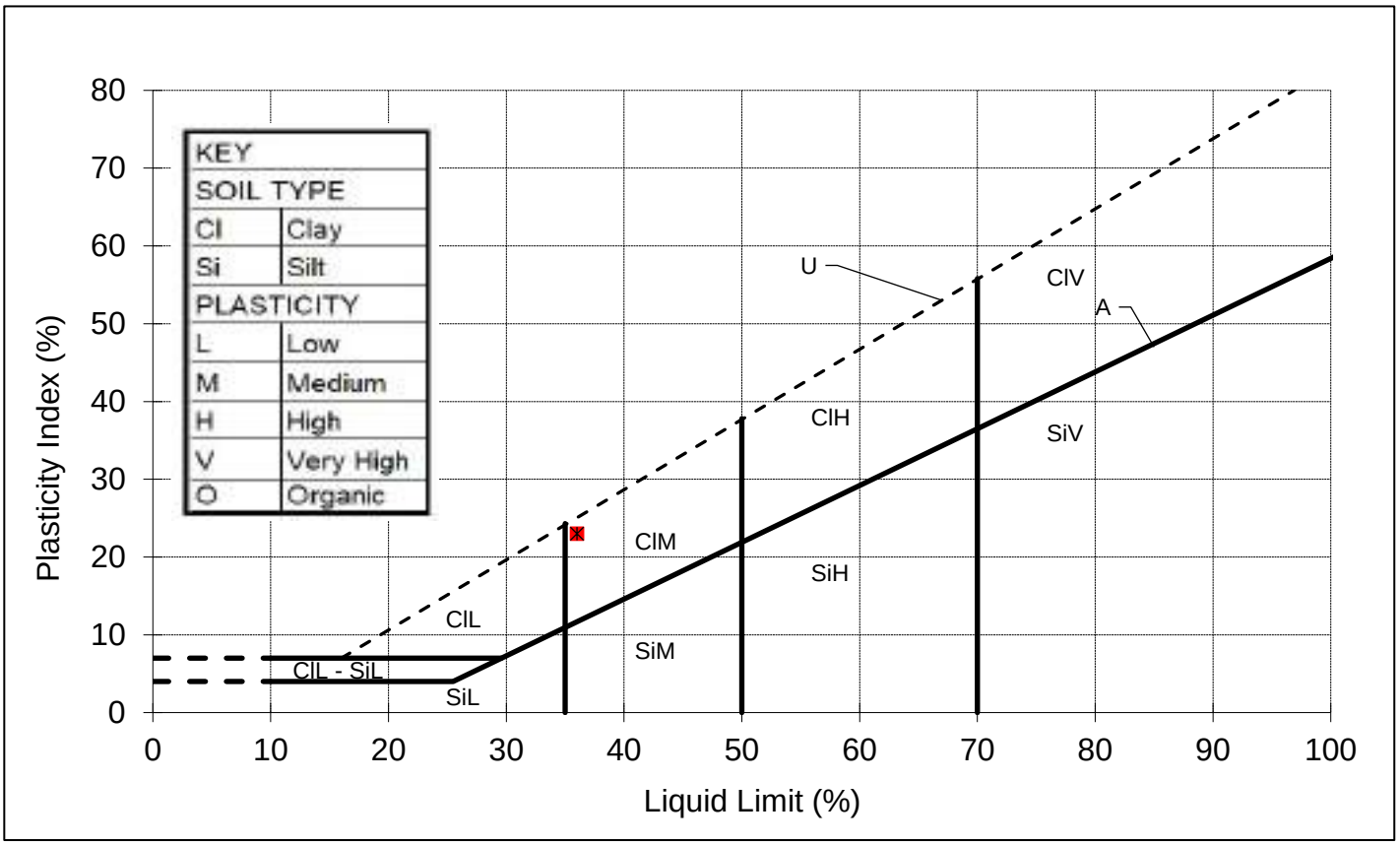
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, H4 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
SAMPLE No.	118609	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
16	36	13	23	78



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

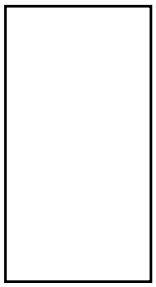
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, H4 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118609	DATE RECEIVED	02-Nov-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	16	%
BULK DENSITY	2.13	Mg/m3
DRY DENSITY	1.83	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.51	219.0	109

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

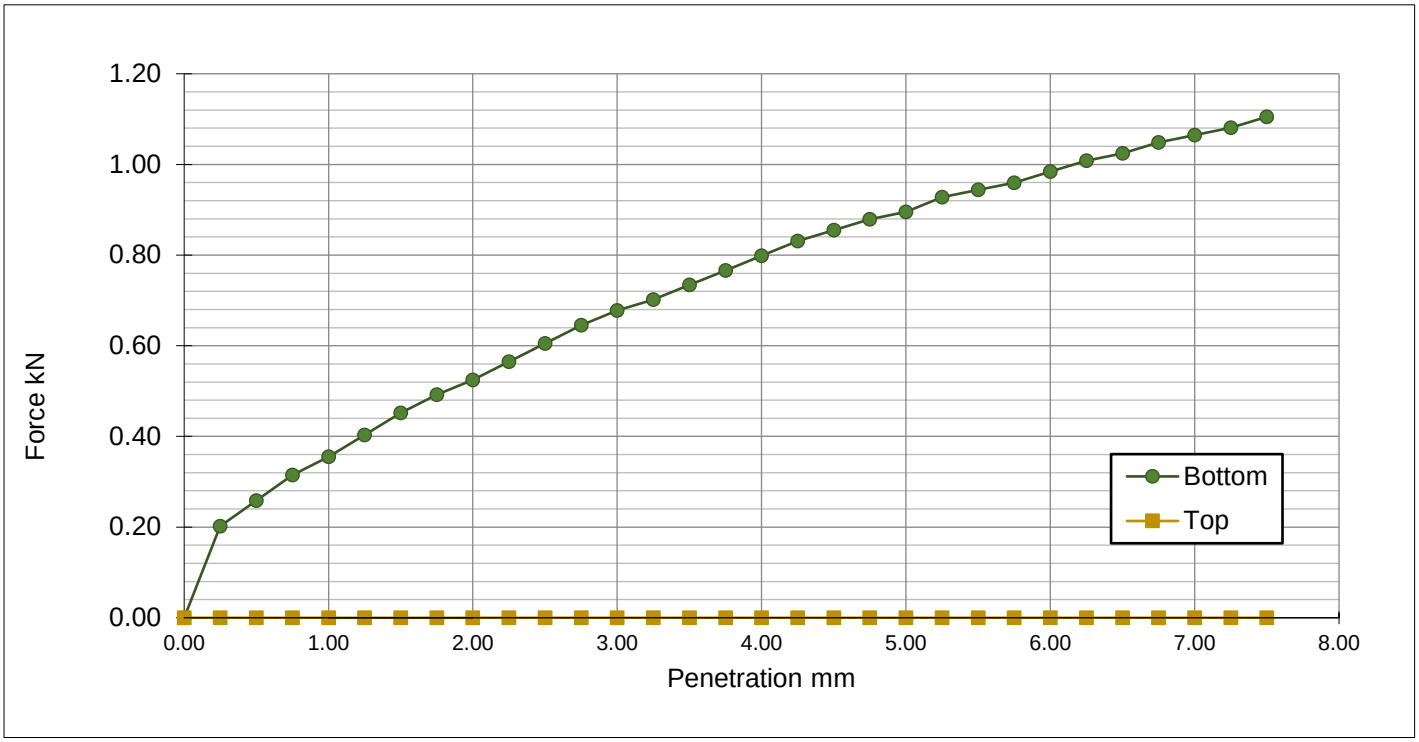
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	0.5m, H4 - Yellow-Brown Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118609	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		0 %			
BULK DENSITY	2.13 Mg/m3	MOISTURE CONTENT	16 %	DRY DENSITY	1.83 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	4.6	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	16	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

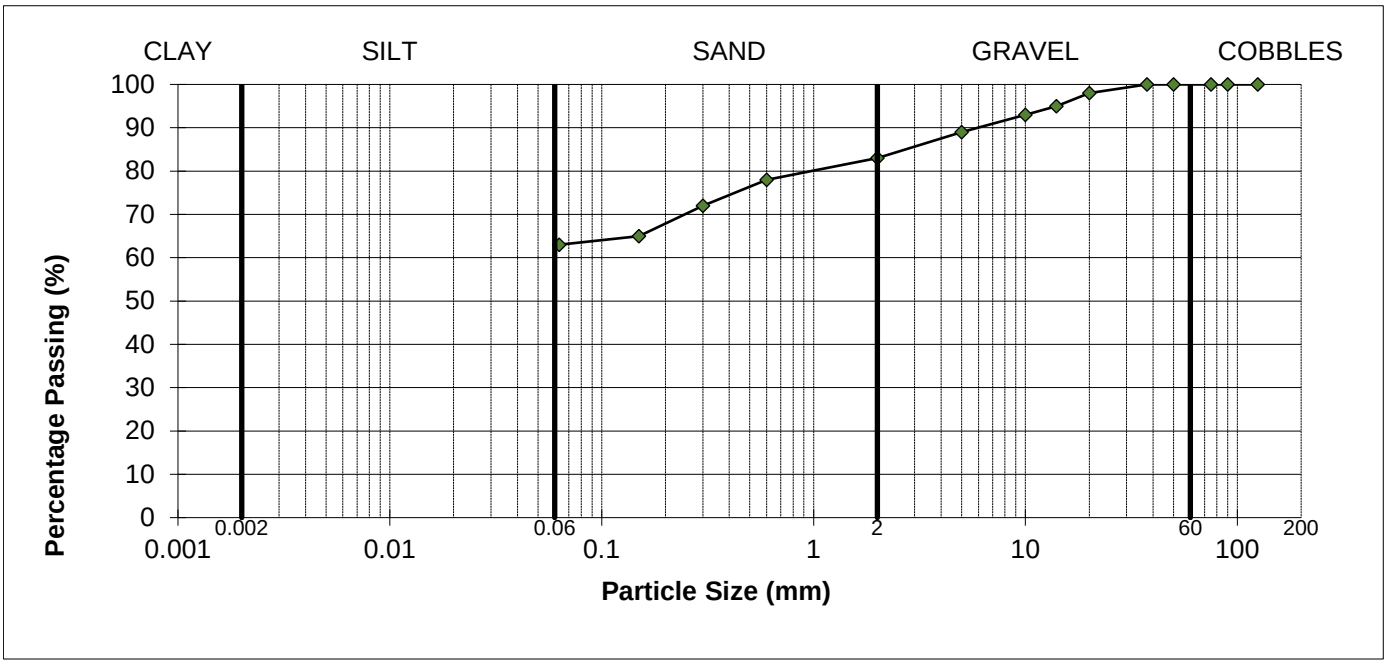
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2.0m, H4 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118610	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	93	
90	100		5	89	
75	100		2	83	
50	100		0.6	78	
37.5	100		0.3	72	
20	98		0.15	65	
14	95		0.063	63	



REMARKS
As received moisture content = 12%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

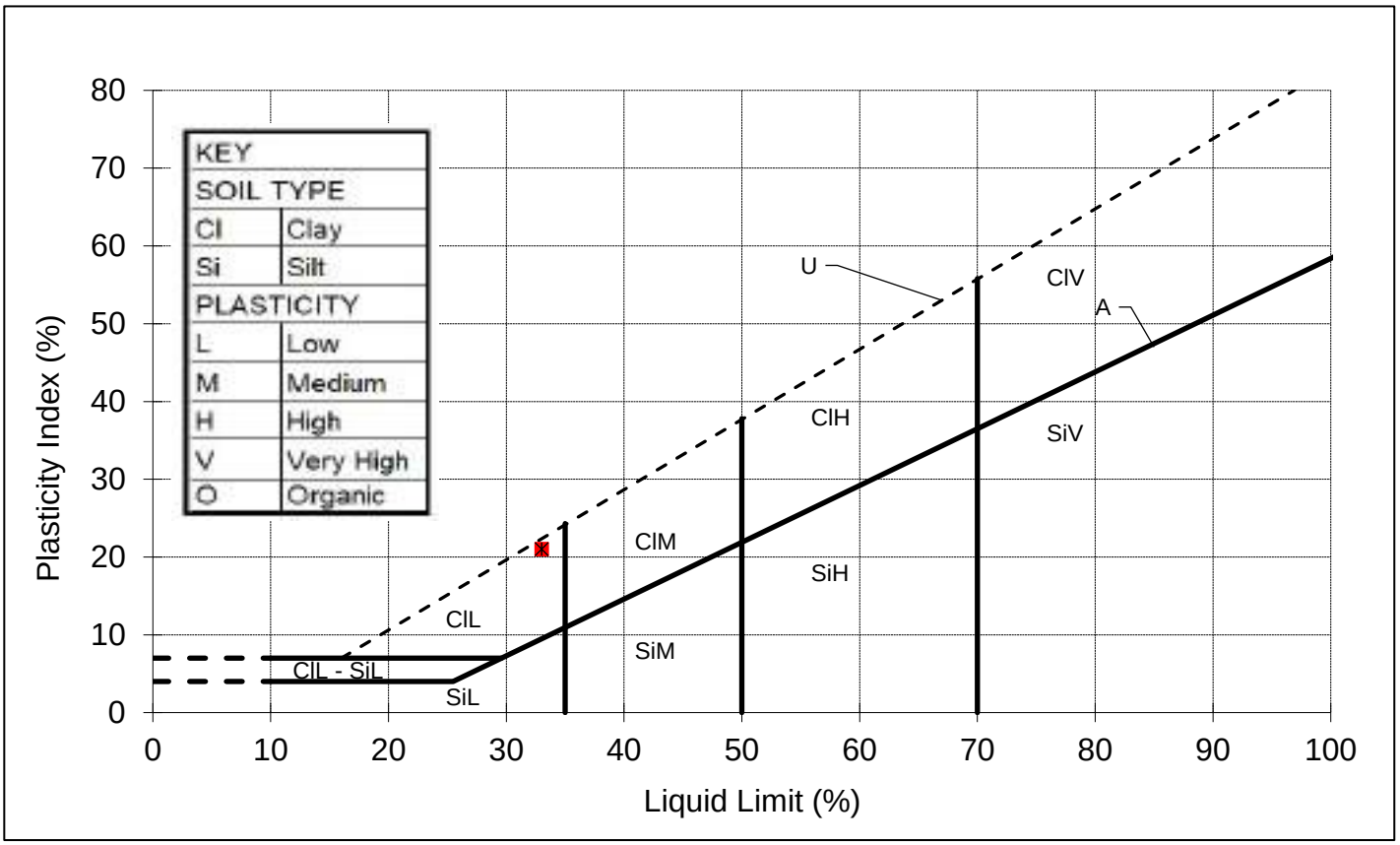
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2.0m, H4 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
SAMPLE No.	118610	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
12	33	12	21	75



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990 Cl. 8
SHW Series 600 Cl. 633

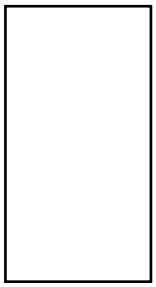
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2.0m, H4 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118610	DATE RECEIVED	02-Nov-22
DATE TESTED	01-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	13	%
BULK DENSITY	2.14	Mg/m3
DRY DENSITY	1.89	Mg/m3
DEPTH OF TOP OF SPECIMEN	N/A	m
RATE OF STRAIN	1	%/min
RUBBER MEMBRANE THICKNESS	0.4	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	1.51	419.1	210

REMARKS
Sample re-compacted at as received moisture content using 2.5kg rammer

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

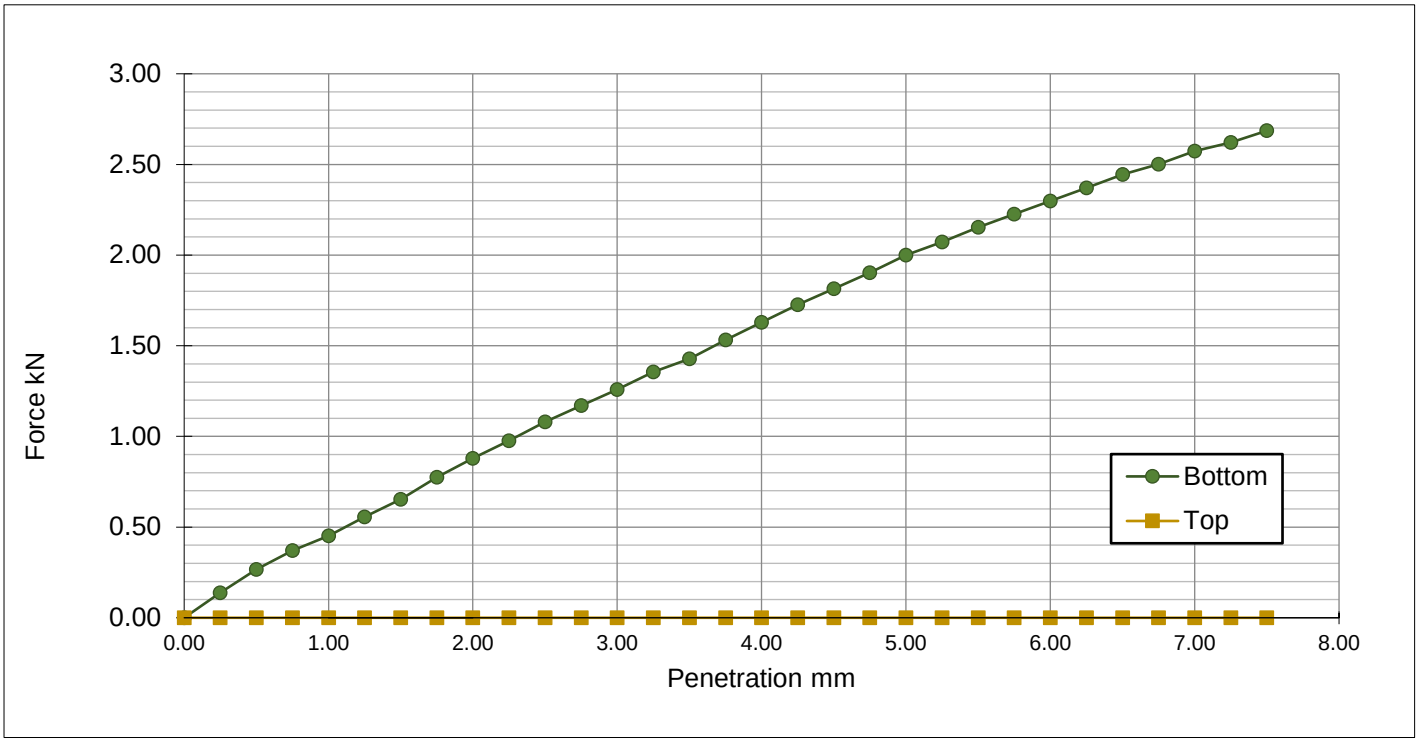
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/97

SAMPLE LABEL	2.0m, H4 - Grey-Gravel Clay	DATE SAMPLED	02-Nov-22
LAB SAMPLE No	118610	DATE RECEIVED	02-Nov-22
DATE TESTED	09-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		2 %			
BULK DENSITY	2.14 Mg/m3	MOISTURE CONTENT	13 %	DRY DENSITY	1.89 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	10.0	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	13	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/98
Date of Issue 21 November 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/98

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	16/11/2022
DATE OF TEST	16/11/2022	SAMPLED BY	Murray Rix
DATE TESTED	17/11/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
118918	SRD I12 L1	Black Ash/Sand	1.77	1.53	16	103.0	2.3
118919	SRD H13 L2	Black Ash/Sand	1.73	1.50	15	101.6	5.1
		Maximum Dry Density (Mg/m^3)		1.48		(Advised by client)	
		Particle Density (Mg/m^3)		2.08		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

MURRAY RIX

CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/99
Date of Issue 21 November 2022
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

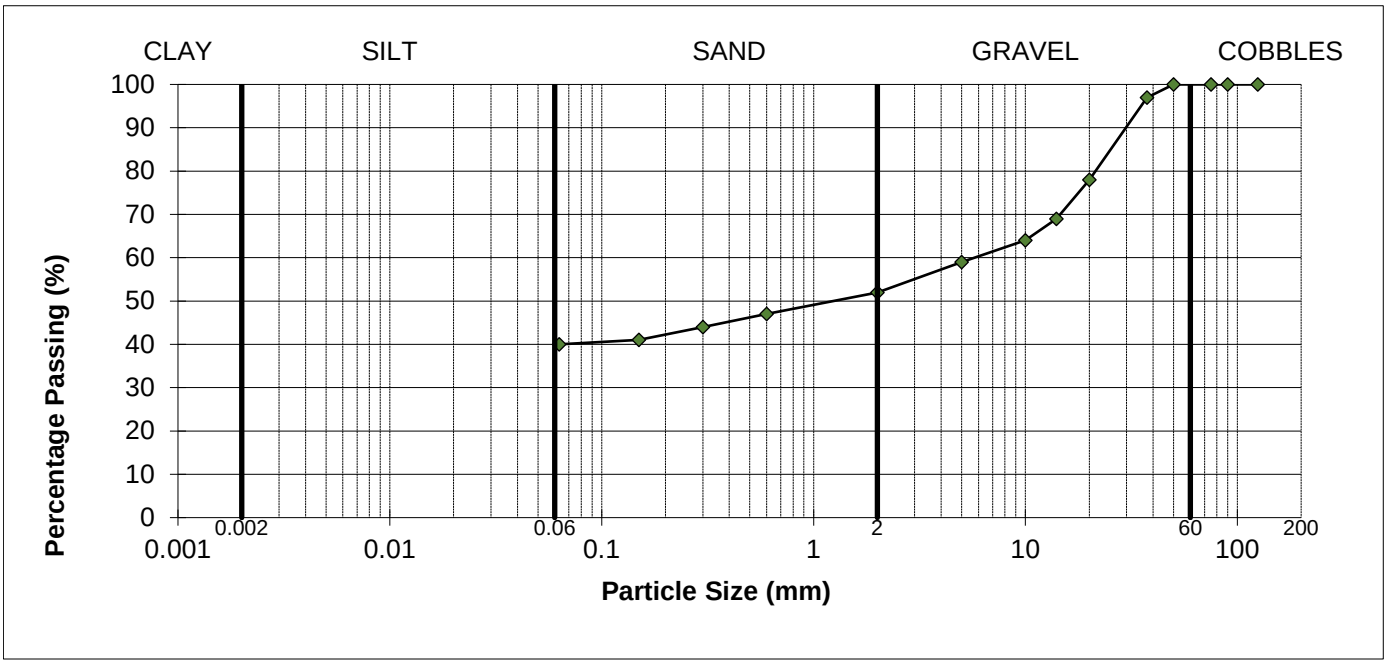
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/99

SAMPLE LABEL	G11-L5-Black gravelly SAND	DATE SAMPLED	14-Nov-22
LAB SAMPLE No	118862	DATE RECEIVED	14-Nov-22
DATE TESTED	15-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	64	
90	100		5	59	
75	100		2	52	
50	100		0.6	47	
37.5	97		0.3	44	
20	78		0.15	41	
14	69		0.063	40	



REMARKS
As received moisture content = 15%

SIGNED

NAME O.P. Davies BA (Hons) (Laboratory Manager) DATE 21-Nov-22

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870 FAX 0161 475 0871

TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

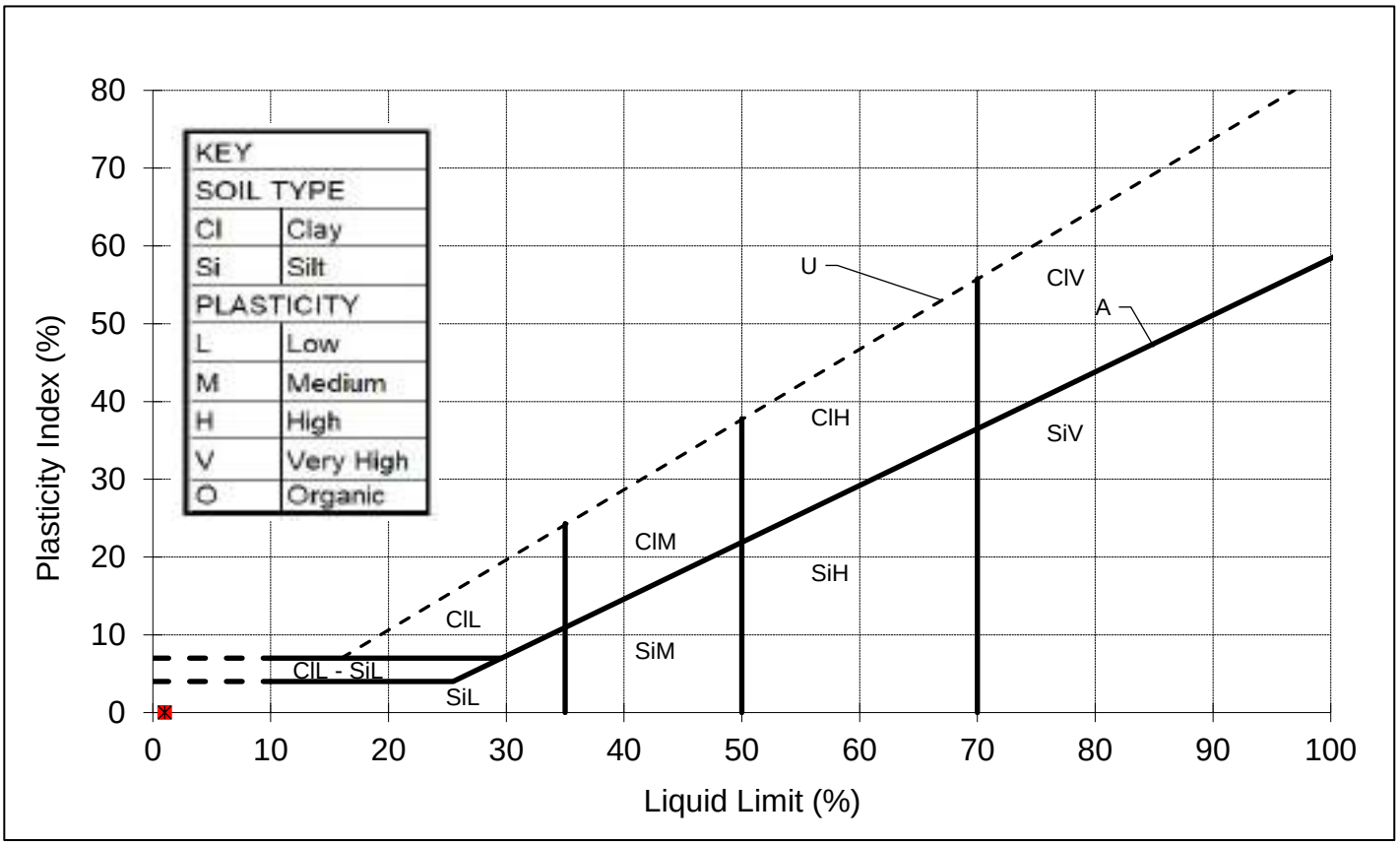
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/99

SAMPLE LABEL	G11-L5-Black gravelly SAND	DATE SAMPLED	14-Nov-22
SAMPLE No.	118862	DATE RECEIVED	14-Nov-22
DATE TESTED	15-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15	N/A	Non Plastic	N/A	46



REMARKS
Sample tested after wet sieving,

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 21-Nov-22

MURRAY RIX

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 4.5kg RAMMER
BS 1377-4:1990
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

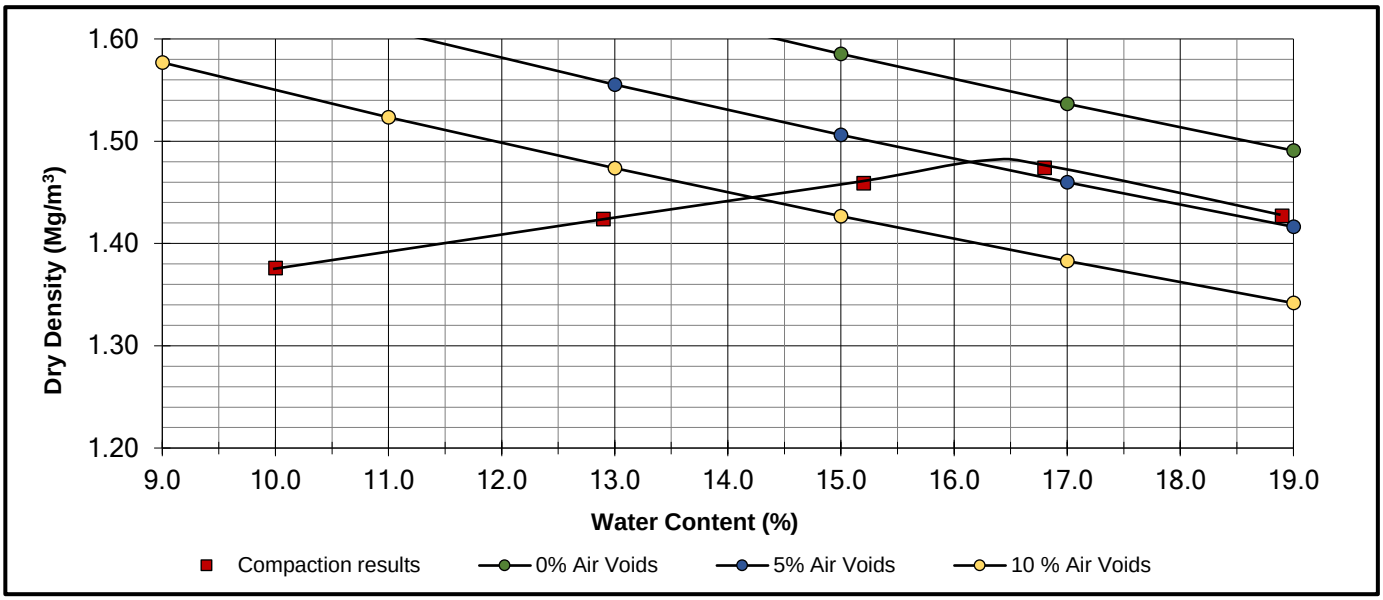
CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/99

SAMPLE LABEL	G11-L5-Black gravelly SAND	DATE SAMPLED	14-Nov-22
SAMPLE NUMBER	118862	DATE RECEIVED	14-Nov-22
DATE TESTED	15-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	3	%	GRADING ZONE	Zone 5	
RETAINED 20mm	22	%	PARTICLE DENSITY	2.08	Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	10.0	1.376
2	12.9	1.424
3	15.2	1.459
4	16.8	1.474
5	18.9	1.427



OPTIMUM WATER CONTENT	**16**	(%)
MAXIMUM DRY DENSITY	**1.48**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

MURRAY RIX

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TEST CERTIFICATE

CALIFORNIA BEARING RATIO (CBR)
BS 1377-2:2022 Cl. 15
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014

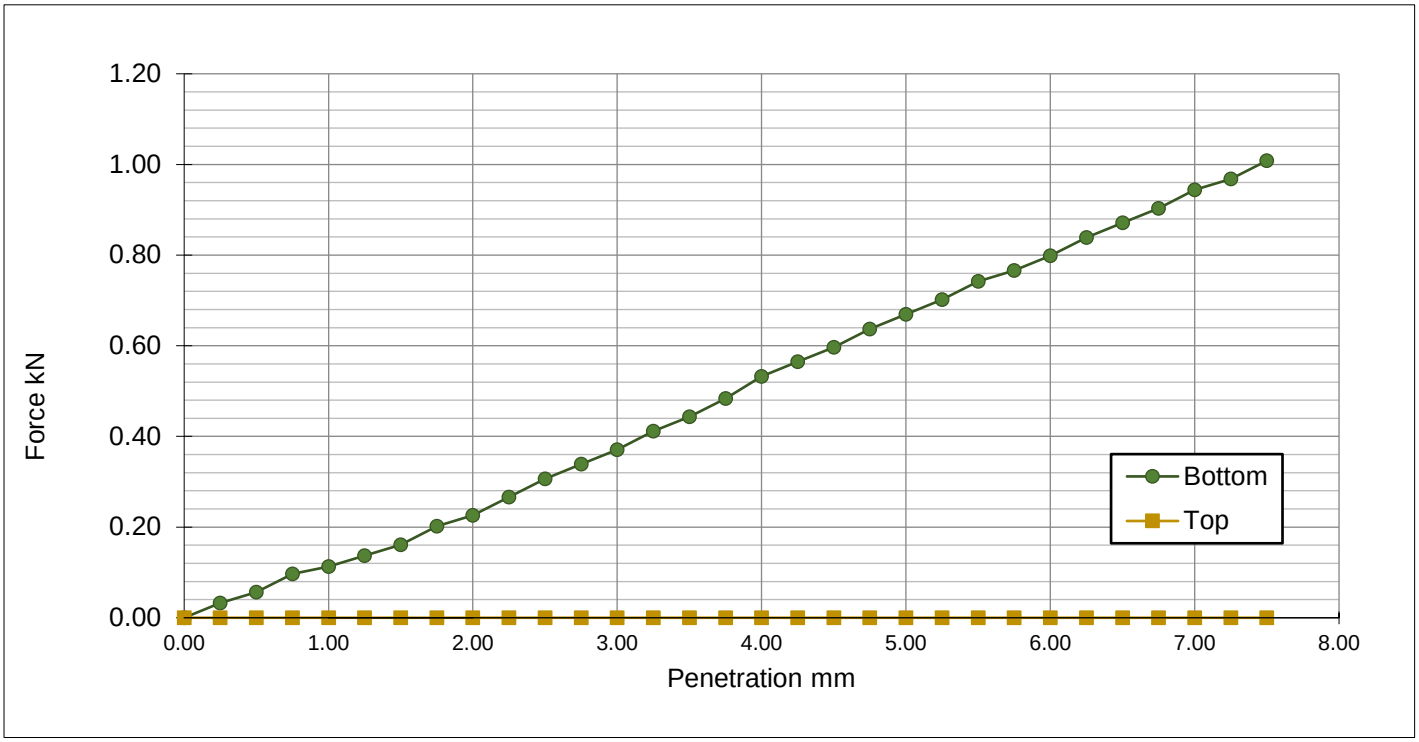
CLIENT	VHE Construction Ltd
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Gtr Manchester BL3 1NP
JOB NUMBER	MRN 4454/99

SAMPLE LABEL	G11-L5-Black gravelly SAND	DATE SAMPLED	14-Nov-22
LAB SAMPLE No	118862	DATE RECEIVED	14-Nov-22
DATE TESTED	15-Nov-22	SAMPLED BY	Client

MATERIAL	General Fill
ADVISED SOURCE	Site Won

INITIAL CONDITIONS

SAMPLE PREPARATION		Dynamic Compaction, Specified Effort, 4.5 kg Rammer			
GREATER THAN 20 mm REMOVED		2 %			
BULK DENSITY	1.67 Mg/m3	MOISTURE CONTENT	20 %	DRY DENSITY	1.39 Mg/m3
TEST CONDITION	Unsoaked	MEASURED SWELL	N/A mm	SURCHARGE	2 kg



CBR VALUE

Top	N/A	%
Bottom	3.3	%

ORIGIN CORRECTION

Top	N/A	mm
Bottom	N/A	mm

FINAL MOISTURE CONTENT

Top	N/A	%
Bottom	20	%

REMARKS

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/100
Date of Issue 23 November 2022

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

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TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP

DATE	22-Nov-22	**JOB NUMBER**	MRN 4454/100
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	H12 L5	225	1.72	1.47	17	99.4	4.2
2	H13 L5	225	1.73	1.48	17	99.9	4.1
3	I11 L5	225	1.72	1.45	19	97.9	3.2
4	I12 L5	225	1.74	1.47	18	99.5	2.5
5	I13 L5	225	1.75	1.47	19	99.4	1.4
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.48	(Advised by client)	
				Particle Density (Mg/m3)	2.08	(Advised by client)	
				Results correct for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-Nov-22

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UKAS TESTING 1580

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/100

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	22/11/2022
DATE OF TEST	22/11/2022	SAMPLED BY	Murray Rix
DATE TESTED	23/11/2022	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
119172	SRD I13 L5	Black Ash/Sand	1.77	1.49	19	100.7	0.1
		Maximum Dry Density (Mg/m^3)		1.48		(Advised by client)	
		Particle Density (Mg/m^3)		2.08		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/102
Date of Issue 24 November 2022
Page 1 of 13

Approved Signatories

S J Hutchings, O P Davies

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UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116455
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	~~SP-Tarmac Crush-1~~ SP-Tarmac Crush-S
Certificate of sampling received	:	No
Date and time of sampling	:	05 September 2022
Date received at Laboratory	:	09 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	11
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.1
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	0.4
Ra	Bituminous materials	88
Rg	Glass	0.2
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.3
FL	Floating Particles (cm^3/kg)	0.3

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

ANALYSIS OF BITUMINOUS MATERIALS

BS EN 12697-1 : 2020

(Binder portion recovered, using equipment in B1.4, B2.3, & B3.1)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton, Greater Manchester BL3 1NP
JOB NUMBER	MRN 4454/102

SITE REFERENCE	SP-Tarmac Crush-S	DATE SAMPLED	05 September 2022
SAMPLE NUMBER	116455	DATE RECEIVED	06 September 2022
DATE TESTED	04 November 2022	SAMPLED BY	Client

MATERIAL	Recycled Crush		
ADVISED SOURCE	Site Won	TRUCK NUMBER	Not advised
SAMPLE LOCATION	SP D11	SAMPLE CERTIFICATE RECEIVED	No

ITEM	DETERMINED VALUE (%)	SPECIFICATION LIMITS (%)
BINDER CONTENT	4.9	Not advised
FILLER CONTENT	N/A	N/A

GRADING		
SIEVE SIZE (mm)	**% PASSING**	**SPECIFICATION LIMITS (%)**
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116605
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-1
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	60
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	3.6
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	30
Ra	Bituminous materials	5.3
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.7

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

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UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116606
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-2
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	55
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	33
Ra	Bituminous materials	8.1
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.7
FL	Floating Particles (cm^3/kg)	0.2

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

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DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116607
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-3
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	73
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.3
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	25
Ra	Bituminous materials	1.8
Rg	Glass	0.2
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.1
FL	Floating Particles (cm^3/kg)	0.5

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

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TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116975
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-4
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	58
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	1.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	37
Ra	Bituminous materials	2.2
Rg	Glass	0.4
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.8
FL	Floating Particles (cm^3/kg)	0.2

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

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TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116976
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-5
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	63
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.3
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	34
Ra	Bituminous materials	1.5
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.3

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

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DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116977
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-6
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	70
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.0
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	24
Ra	Bituminous materials	5.2
Rg	Glass	0.3
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.5
FL	Floating Particles (cm^3/kg)	0.1

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116978
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-7
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	58
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.1
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	33
Ra	Bituminous materials	6.1
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.5

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116979
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-8
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	61
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	1.2
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	34
Ra	Bituminous materials	3.5
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.5
FL	Floating Particles (cm^3/kg)	0.3

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116980
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-9
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	48
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	3.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	45
Ra	Bituminous materials	2.6
Rg	Glass	0.8
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.4

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102
Laboratory sample number	:	116981
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-10
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	53
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.8
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	40
Ra	Bituminous materials	3.2
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.2
FL	Floating Particles (cm^3/kg)	0.7

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant, Stopes Road,
Bolton, Greater Manchester BL3 1NP

Job Number MRN 4454/102A
Date of Issue 24 November 2022
Page 1 of 11

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116605
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-1
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	60
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	3.6
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	30
Ra	Bituminous materials	5.3
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.7

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116606
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-2
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	55
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	33
Ra	Bituminous materials	8.1
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.7
FL	Floating Particles (cm^3/kg)	0.2

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116607
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-3
Certificate of sampling received	:	No
Date and time of sampling	:	12 September 2022
Date received at Laboratory	:	12 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP D11
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	73
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.3
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	25
Ra	Bituminous materials	1.8
Rg	Glass	0.2
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.1
FL	Floating Particles (cm^3/kg)	0.5

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116975
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-4
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	58
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	1.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	37
Ra	Bituminous materials	2.2
Rg	Glass	0.4
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.8
FL	Floating Particles (cm^3/kg)	0.2

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116976
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-5
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	63
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.3
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	34
Ra	Bituminous materials	1.5
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.3

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116977
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-6
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	70
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	0.0
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	24
Ra	Bituminous materials	5.2
Rg	Glass	0.3
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.5
FL	Floating Particles (cm^3/kg)	0.1

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116978
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-7
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	58
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.1
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	33
Ra	Bituminous materials	6.1
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.5

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116979
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-8
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	61
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	1.2
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	34
Ra	Bituminous materials	3.5
Rg	Glass	0.5
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.5
FL	Floating Particles (cm^3/kg)	0.3

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116980
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-9
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	48
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	3.5
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	45
Ra	Bituminous materials	2.6
Rg	Glass	0.8
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.4
FL	Floating Particles (cm^3/kg)	0.4

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1560

TEST CERTIFICATE

DETERMINATION OF CONSTITUENTS OF COARSE RECYCLED AGGREGATE

BS EN 933-11:2009

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton

SAMPLE DETAILS

Job Number	:	MRN 4454/102A
Laboratory sample number	:	116981
Material	:	Recycled Crush
Advised source	:	Site Won
Site mark	:	SP-6F2 Mix-10
Certificate of sampling received	:	No
Date and time of sampling	:	23 September 2022
Date received at Laboratory	:	23 September 2022
Date of start of test	:	04 November 2022
Sampling Location	:	SP 6F2
Method of sampling	:	BS EN 932-1 : 1997
Sampled by	:	Client
Mass of dry sample tested	:	50 kg
Drying Temperature	:	40 ± 5°C

RESULT

Constituent	Description	Proportion (%)
Rc	Concrete, Concrete products, Mortar, Concrete masonry units	53
Ru	Unbound aggregate, Natural stone, Hydraulically bound aggregate	2.8
Rb	Clay masonry units (i.e. bricks & tiles), Calcium silicate masonry units, Aerated non-floating concrete	40
Ra	Bituminous materials	3.2
Rg	Glass	0.7
X	Other: Cohesive (i.e. clay & soil), Metals (ferrous & non-ferrous), Non-floating wood, plastic & rubber, Gypsum plaster	0.2
FL	Floating Particles (cm^3/kg)	0.7

Comments

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 24-Nov-22

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/1
Date of Issue 21 April 2023
Page 1 of 7

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	20-Apr-23	**JOB NUMBER**	MRN 4742/1
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	F14 L1	150	1.92	1.60	20	101.9	1.2
2	F14 L2	150	1.80	1.48	22	94.2	5.9
3	F14 L3	150	1.83	1.48	24	94.2	3.4
4	F14 L4	150	1.92	1.61	19	102.6	1.8
5	F13 L1	150	1.78	1.49	19	95.1	9.4
6	F13 L2	150	1.79	1.51	18	96.4	9.7
7	F13 L3	150	1.82	1.50	21	95.8	5.7
8	F13 L4	150	1.84	1.54	20	97.9	5.3
9	G13 L1	150	1.85	1.51	22	96.4	3.7
10	G13 L2	150	1.79	1.49	20	95.2	7.8
11	G13 L3	150	1.78	1.49	19	95.1	9.5
12	G13 L4	150	1.78	1.49	19	95.0	9.5
13	G14 L1	150	1.85	1.49	24	95.2	2.2
14	G14 L2	150	1.78	1.50	19	95.5	9.1
15	G14 L3	150	1.85	1.53	21	97.4	4.2
16	G14 L4	150	1.82	1.50	21	95.8	5.7
17	G14 L5	150	1.86	1.52	22	97.1	2.9
18	G13 L5	150	1.79	1.52	18	96.6	9.5
19	F13 L5	150	1.77	1.49	19	94.9	9.6
20	F13 L6	150	1.81	1.55	17	98.6	9.2
				Maximum Dry Density (Mg/m3)	1.57	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	20-Apr-23	**JOB NUMBER**	MRN 4742/1
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	24958
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	F13 L7	150	1.84	1.55	19	98.5	6.2
22	F13 L8	150	1.80	1.51	19	96.1	8.5
23	F14 L5	150	1.80	1.50	20	95.5	7.6
24	F14 L6	150	1.83	1.51	22	96.0	4.4
25	F14 L7	150	1.78	1.48	20	94.3	8.8
26	F14 L8	150	1.91	1.55	23	98.8	0.0
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.57	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 21-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP			
JOB NUMBER	MRN 4742/1			
TEST LOCATION	G14 L5	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	20-Apr-23	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4862	4621	4762	4748	0.00	0.00	0.0
4684	4472	4606	4587	-1.61	4.00	14.1
4709	4514	4637	4620	-1.28	0.00	0.0
4672	4475	4602	4583	-1.65	4.00	14.1
4650	4442	4577	4556	-1.92	6.00	21.2
4649	4413	4551	4538	-2.11	9.00	31.8
4637	4398	4546	4527	-2.21	12.00	42.4
4608	4383	4538	4510	-2.39	15.00	53.1
4591	4368	4494	4484	-2.64	17.00	60.1
4635	4431	4574	4547	-2.02	0.00	0.0
4618	4417	4552	4529	-2.19	4.00	14.1
4598	4402	4538	4513	-2.36	7.00	24.8
4586	4382	4518	4495	-2.53	9.00	31.8
4564	4365	4498	4476	-2.73	12.00	42.4
4541	4356	4472	4456	-2.92	15.00	53.1
4477	4310	4457	4415	-3.34	17.00	60.1
4577	4405	4543	4508	-2.40	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	57	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.0	%
Surface Stiffness Modulus (E) =	49	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	59	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.3	%
Surface Stiffness Modulus (E) =	51	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 10-May-23

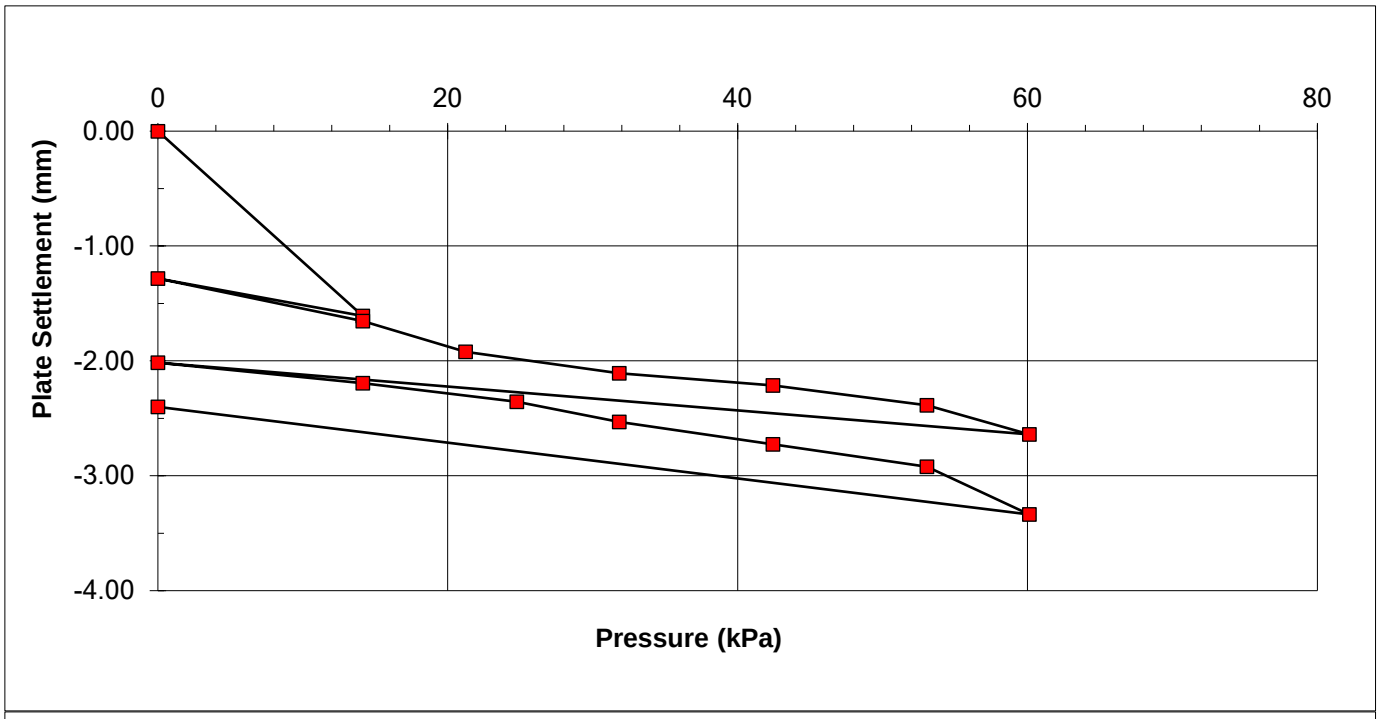
MURRAY RIX

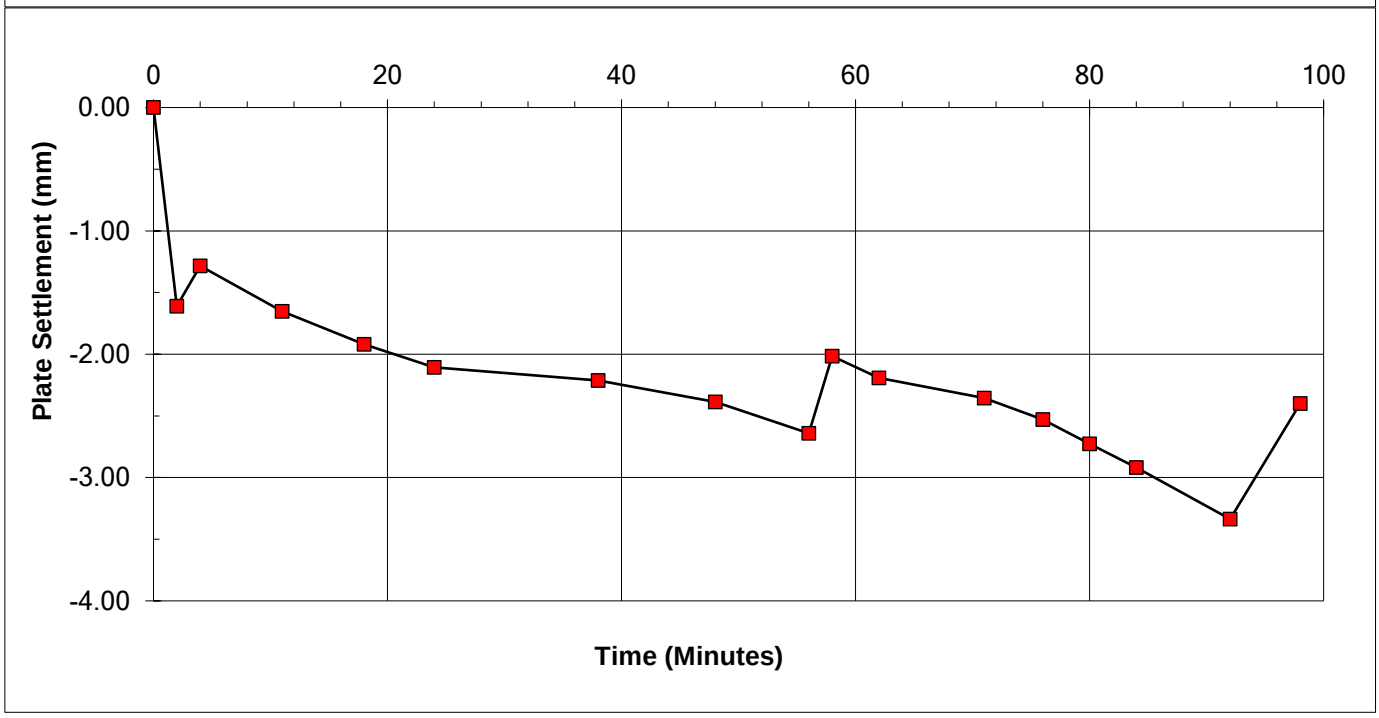
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 10-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP			
JOB NUMBER	MRN 4742/1			
TEST LOCATION	F14 L4	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	20-Apr-23	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4982	4696	4715	4798	0.00	0.00	0.0
4776	4525	4567	4623	-1.75	5.00	17.7
4833	4558	4593	4661	-1.36	0.00	0.0
4799	4529	4545	4624	-1.73	5.00	17.7
4779	4502	4521	4601	-1.97	8.00	28.3
4761	4476	4513	4583	-2.14	10.00	35.4
4744	4471	4507	4574	-2.24	12.00	42.4
4727	4457	4495	4560	-2.38	14.00	49.5
4716	4421	4458	4532	-2.66	17.00	60.1
4724	4463	4496	4561	-2.37	0.00	0.0
4696	4434	4470	4533	-2.64	5.00	17.7
4671	4409	4446	4509	-2.89	8.00	28.3
4656	4384	4426	4489	-3.09	10.00	35.4
4648	4368	4402	4473	-3.25	13.00	46.0
4605	4343	4377	4442	-3.56	16.00	56.6
4569	4313	4340	4407	-3.90	18.00	63.7
4651	4393	4411	4485	-3.13	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	47	MPa/m
Equivalent 762 mm plate reaction =	38	MPa/m
Equivalent CBR =	5.2	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

Surface Stiffness Modulus Ratio =	1.0

DATE 10-May-23

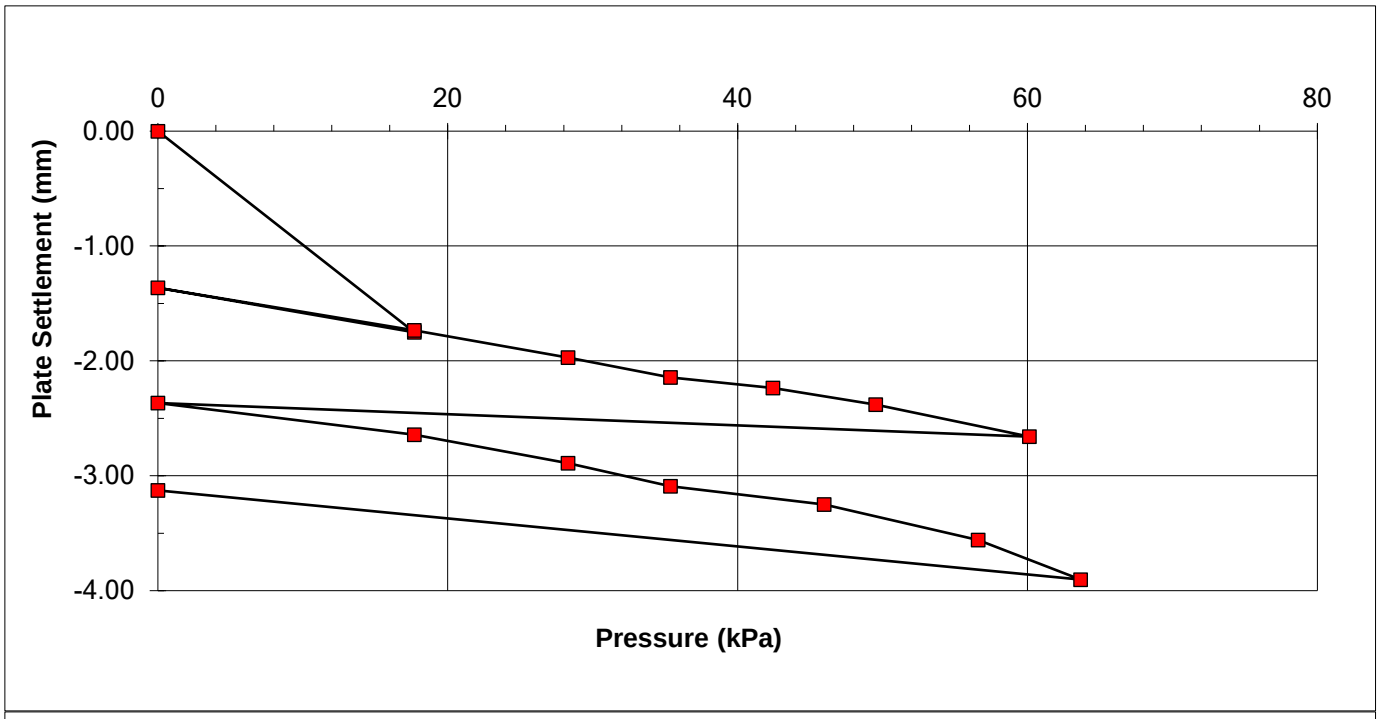
MURRAY RIX

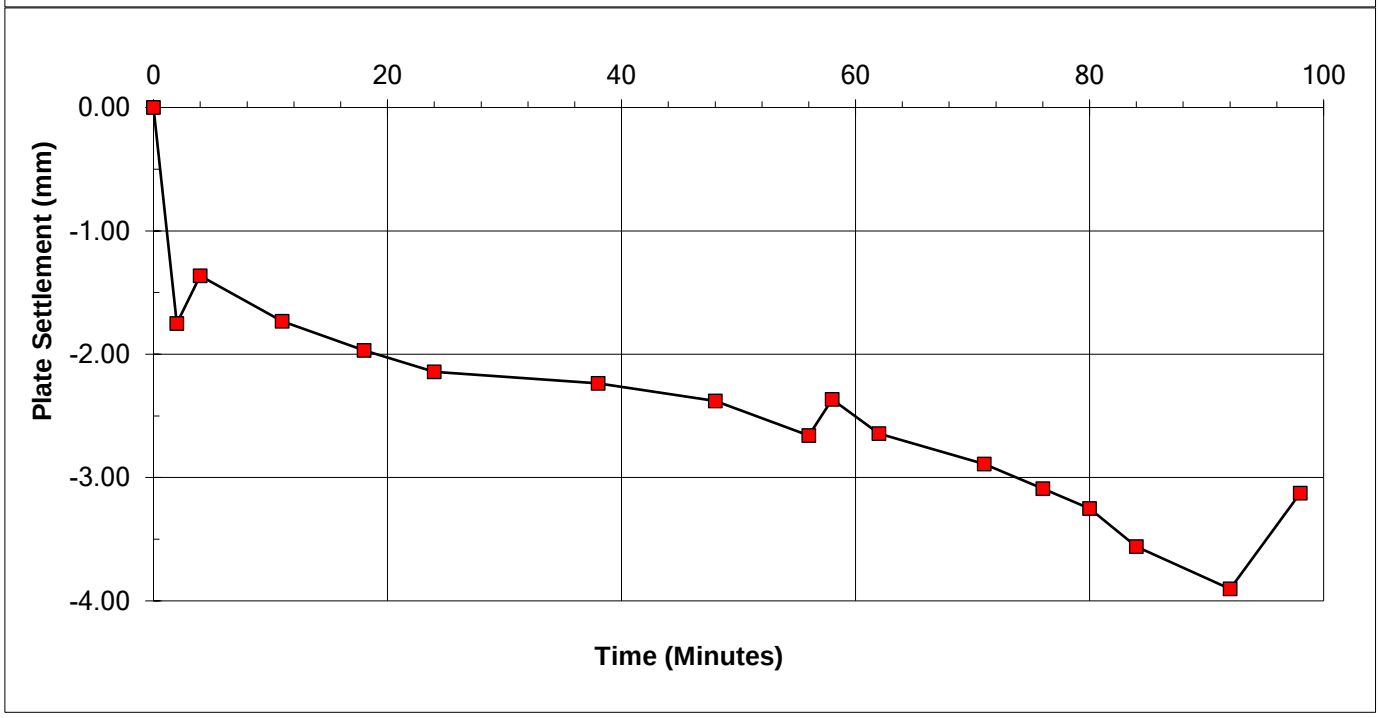
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 10-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/2
Date of Issue 26 April 2023
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	25-Apr-23	**JOB NUMBER**	MRN 4742/2
MATERIAL	Black Ash/Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	F18 L1	200	1.84	1.54	20	101.3	5.8
2	F18 L2	200	1.82	1.57	16	103.2	9.5
3	F18 L3	200	1.82	1.50	21	99.0	5.7
4	F18 L4	200	1.78	1.48	20	97.5	8.6
5	F17 L1	200	1.83	1.57	16	103.6	8.9
6	F17 L2	200	1.87	1.56	20	102.5	3.7
7	F17 L3	200	1.83	1.57	17	103.1	8.2
8	F17 L4	200	1.88	1.56	20	102.5	3.4
9	F19 L1	200	1.83	1.49	23	98.3	4.2
10	F19 L2	200	1.93	1.60	21	105.0	0.3
11	F19 L3	200	1.85	1.50	23	99.0	2.7
12	F19 L4	200	1.87	1.56	20	102.5	4.0
13	G19 L1	200	1.87	1.58	19	103.7	4.8
14	G19 L2	200	1.84	1.55	19	101.7	6.2
15	G19 L3	200	1.86	1.57	19	103.4	5.4
16	G19 L4	200	1.87	1.57	20	103.0	4.2
17	F20 L2	200	1.87	1.55	21	101.7	3.2
18	F20 L3	200	1.81	1.50	21	98.4	6.3
19	F20 L4	200	1.82	1.53	19	100.6	7.2
20							
				Maximum Dry Density (Mg/m3)	1.52	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 26-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/2		
TEST LOCATION	E17 L4	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	25-Apr-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Black Ash/Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4868	4723	4649	4747	0.00	0.00	0.0
4723	4551	4496	4590	-1.57	3.00	10.6
4763	4576	4553	4631	-1.16	0.00	0.0
4741	4550	4534	4608	-1.38	3.00	10.6
4723	4538	4501	4587	-1.59	6.00	21.2
4691	4518	4481	4563	-1.83	9.00	31.8
4684	4485	4463	4544	-2.03	12.00	42.4
4643	4462	4441	4515	-2.31	15.00	53.1
4614	4439	4426	4493	-2.54	18.00	63.7
4643	4484	4488	4538	-2.08	0.00	0.0
4626	4470	4466	4521	-2.26	3.00	10.6
4606	4455	4452	4504	-2.42	6.00	21.2
4594	4435	4432	4487	-2.60	9.00	31.8
4572	4418	4412	4467	-2.79	12.00	42.4
4549	4409	4386	4448	-2.99	15.00	53.1
4485	4363	4371	4406	-3.40	18.00	63.7
4585	4458	4457	4500	-2.47	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	58	kPa
Modulus of subgrade reaction (k) =	46	MPa/m
Equivalent 762 mm plate reaction =	37	MPa/m
Equivalent CBR =	5.1	%
Surface Stiffness Modulus (E) =	50	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	62	kPa
Modulus of subgrade reaction (k) =	50	MPa/m
Equivalent 762 mm plate reaction =	40	MPa/m
Equivalent CBR =	5.7	%
Surface Stiffness Modulus (E) =	54	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 26-Apr-23

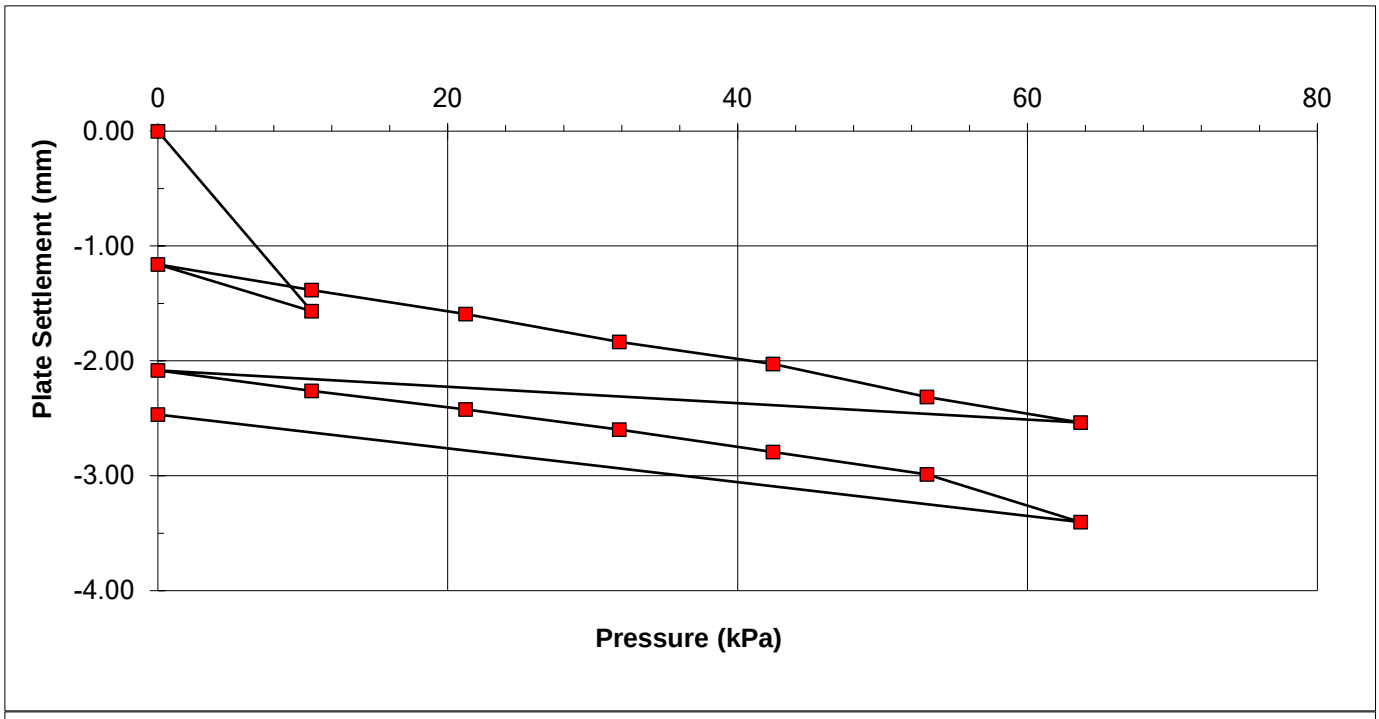
MURRAY RIX

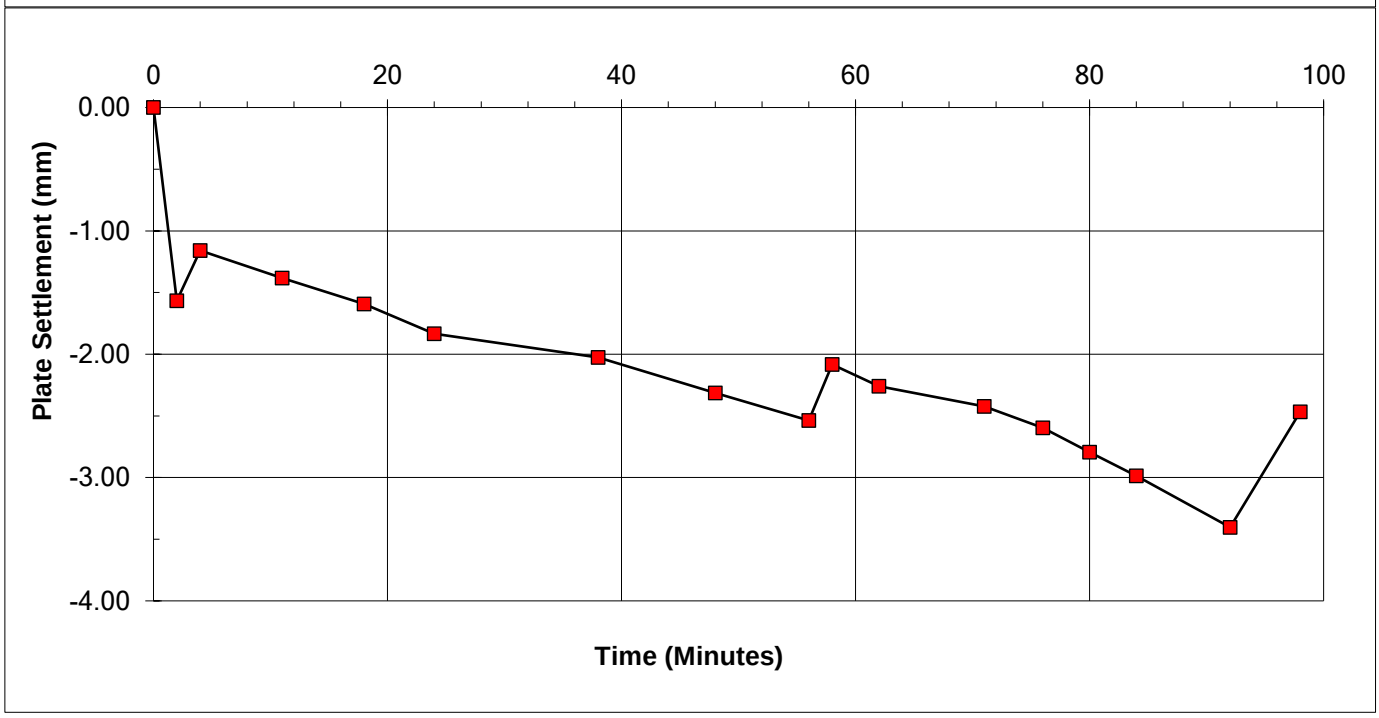
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 26-Apr-23

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/2

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	25-Apr-23
DATE OF TEST	25-Apr-23	SAMPLED BY	Murray Rix
DATE TESTED	26-Apr-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124156	F17 L1	Black Ash / Sand	1.81	1.56	16	99.6	9.8
124157	F20 L2	Black Ash / Sand	1.87	1.56	20	99.2	3.9
		Maximum Dry Density (Mg/m^3)		1.57		(Advised by client)	
		Particle Density (Mg/m^3)		2.40		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 26-Apr-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/3
Date of Issue 27 April 2023
Page 1 of 6

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP			
JOB NUMBER	MRN 4742/3			
TEST LOCATION	H9 L8	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	26-Apr-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Clay Fill	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4699	4794	4903	4799	0.00	0.00	0.0
4546	4750	4775	4690	-1.08	4.00	14.1
4584	4790	4828	4734	-0.65	0.00	0.0
4555	4761	4801	4706	-0.93	3.00	10.6
4536	4731	4772	4680	-1.19	5.00	17.7
4500	4703	4739	4647	-1.51	8.00	28.3
4484	4680	4719	4628	-1.71	10.00	35.4
4449	4650	4689	4596	-2.03	12.00	42.4
4398	4605	4647	4550	-2.49	14.00	49.5
4452	4682	4735	4623	-1.76	0.00	0.0
4428	4659	4708	4598	-2.00	4.00	14.1
4397	4629	4679	4568	-2.30	8.00	28.3
4370	4592	4643	4535	-2.64	11.00	38.9
4339	4561	4610	4503	-2.95	14.00	49.5
4302	4530	4579	4470	-3.28	16.00	56.6
4268	4498	4547	4438	-3.61	19.00	67.2
4339	4593	4662	4531	-2.67	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	40	kPa
Modulus of subgrade reaction (k) =	32	MPa/m
Equivalent 762 mm plate reaction =	25	MPa/m
Equivalent CBR =	2.6	%
Surface Stiffness Modulus (E) =	33	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	51	kPa
Modulus of subgrade reaction (k) =	41	MPa/m
Equivalent 762 mm plate reaction =	33	MPa/m
Equivalent CBR =	4.0	%
Surface Stiffness Modulus (E) =	43	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 27-Apr-23

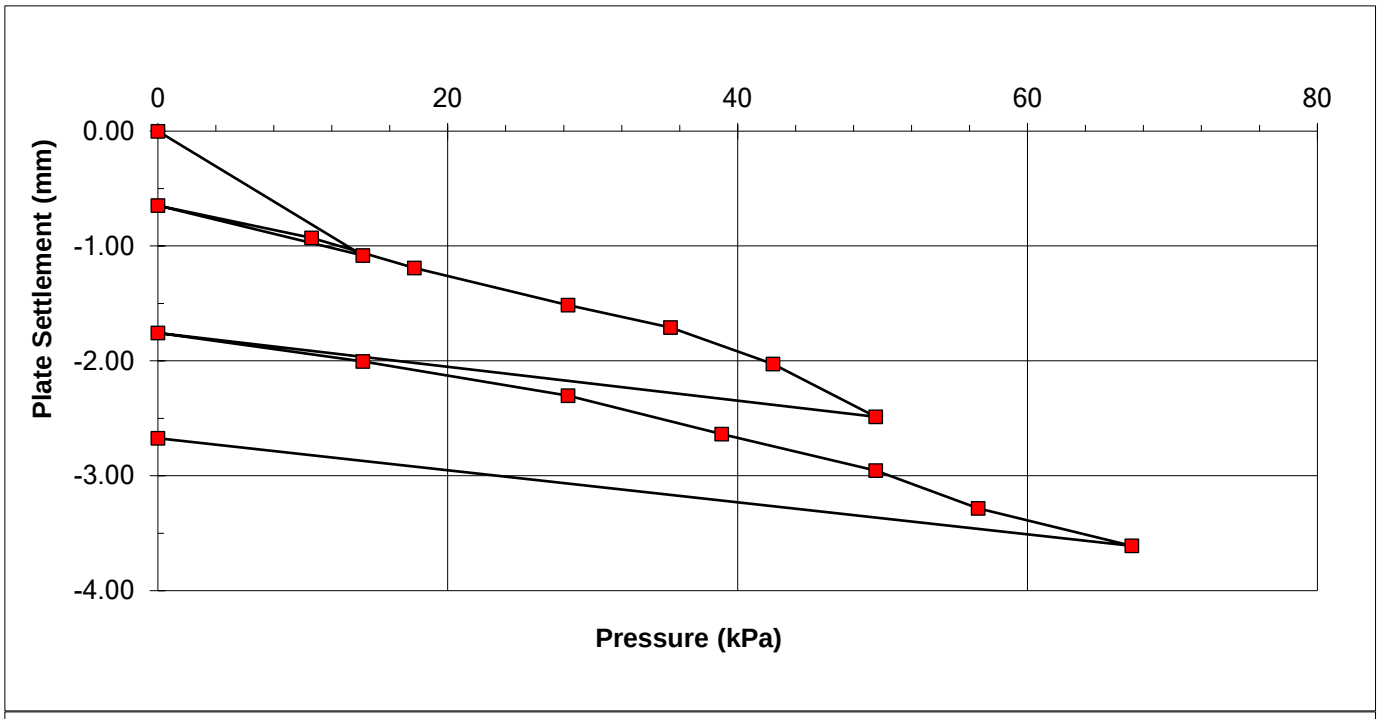
MURRAY RIX

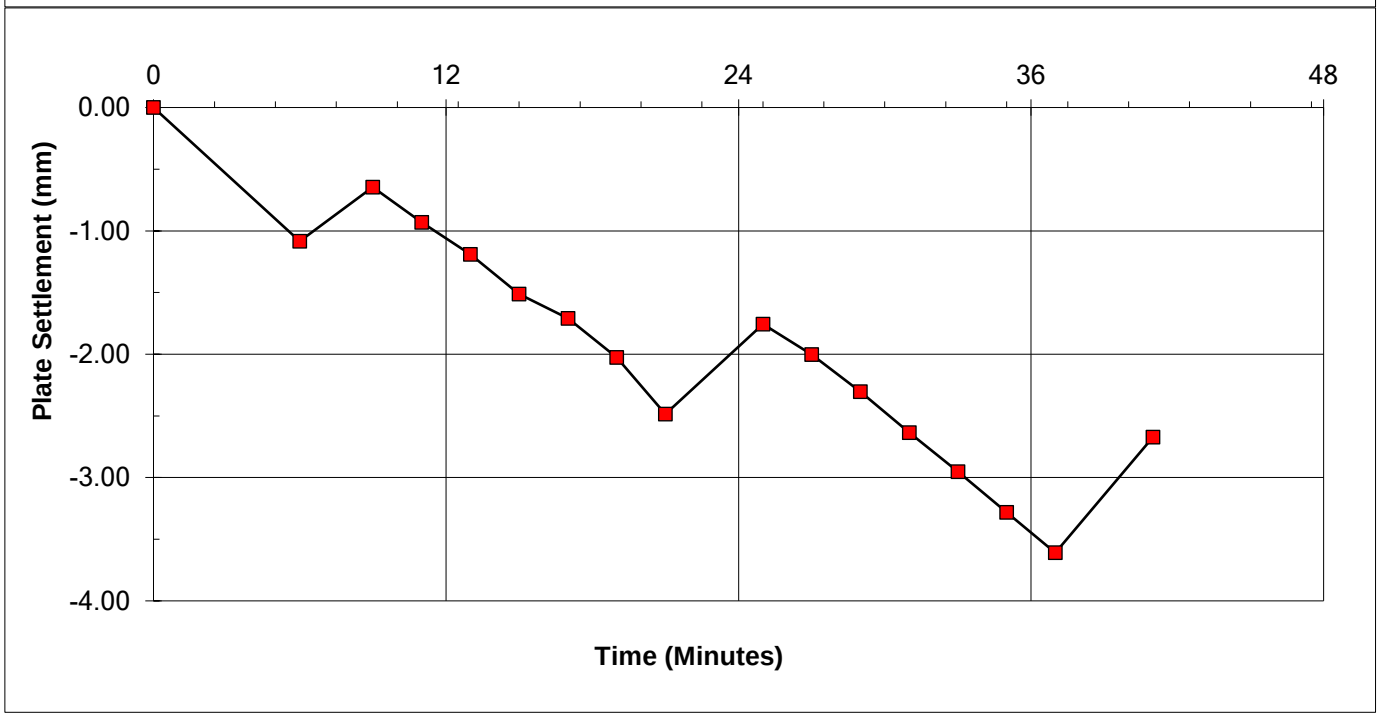
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 27-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)

Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP			
JOB NUMBER	MRN 4742/3			
TEST LOCATION	H8 L4	LOADING DEVICE	20 Tonne Enerpac Jack	
TEST DATE	26-Apr-22	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Clay Fill	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4892	4924	4876	4897	0.00	0.00	0.0
4738	4779	4726	4748	-1.50	3.00	10.6
4772	4812	4760	4781	-1.16	0.00	0.0
4757	4798	4742	4766	-1.32	2.00	7.1
4728	4770	4721	4740	-1.58	4.00	14.1
4694	4758	4695	4716	-1.82	6.00	21.2
4671	4736	4656	4688	-2.10	9.00	31.8
4653	4705	4624	4661	-2.37	11.00	38.9
4613	4668	4592	4624	-2.73	13.00	46.0
4644	4677	4633	4651	-2.46	0.00	0.0
4617	4649	4605	4624	-2.74	3.00	10.6
4590	4622	4579	4597	-3.00	6.00	21.2
4567	4591	4550	4569	-3.28	8.00	28.3
4537	4561	4517	4538	-3.59	11.00	38.9
4507	4534	4489	4510	-3.87	14.00	49.5
4478	4506	4458	4481	-4.17	18.00	63.7
4552	4598	4543	4564	-3.33	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	40	kPa
Modulus of subgrade reaction (k) =	32	MPa/m
Equivalent 762 mm plate reaction =	26	MPa/m
Equivalent CBR =	2.7	%
Surface Stiffness Modulus (E) =	33	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	43	kPa
Modulus of subgrade reaction (k) =	35	MPa/m
Equivalent 762 mm plate reaction =	28	MPa/m
Equivalent CBR =	3.1	%
Surface Stiffness Modulus (E) =	36	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

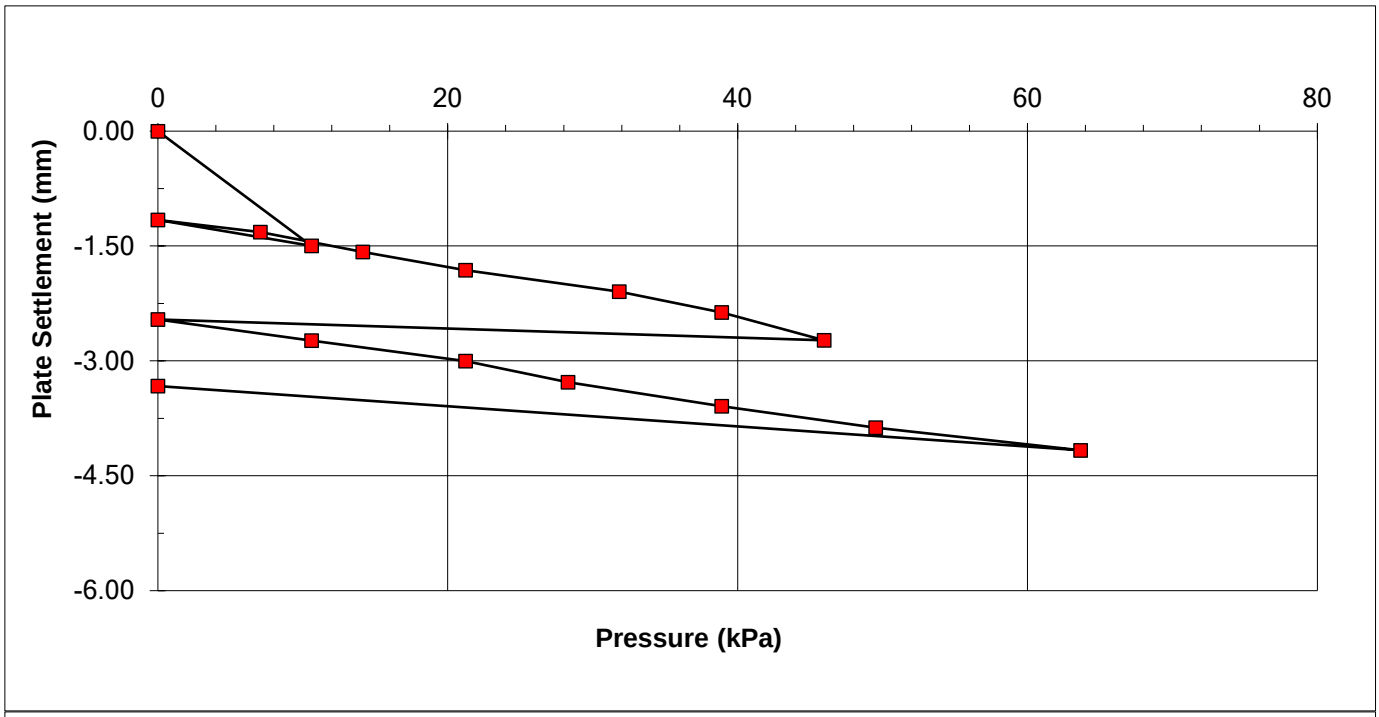
DATE 27-Apr-23

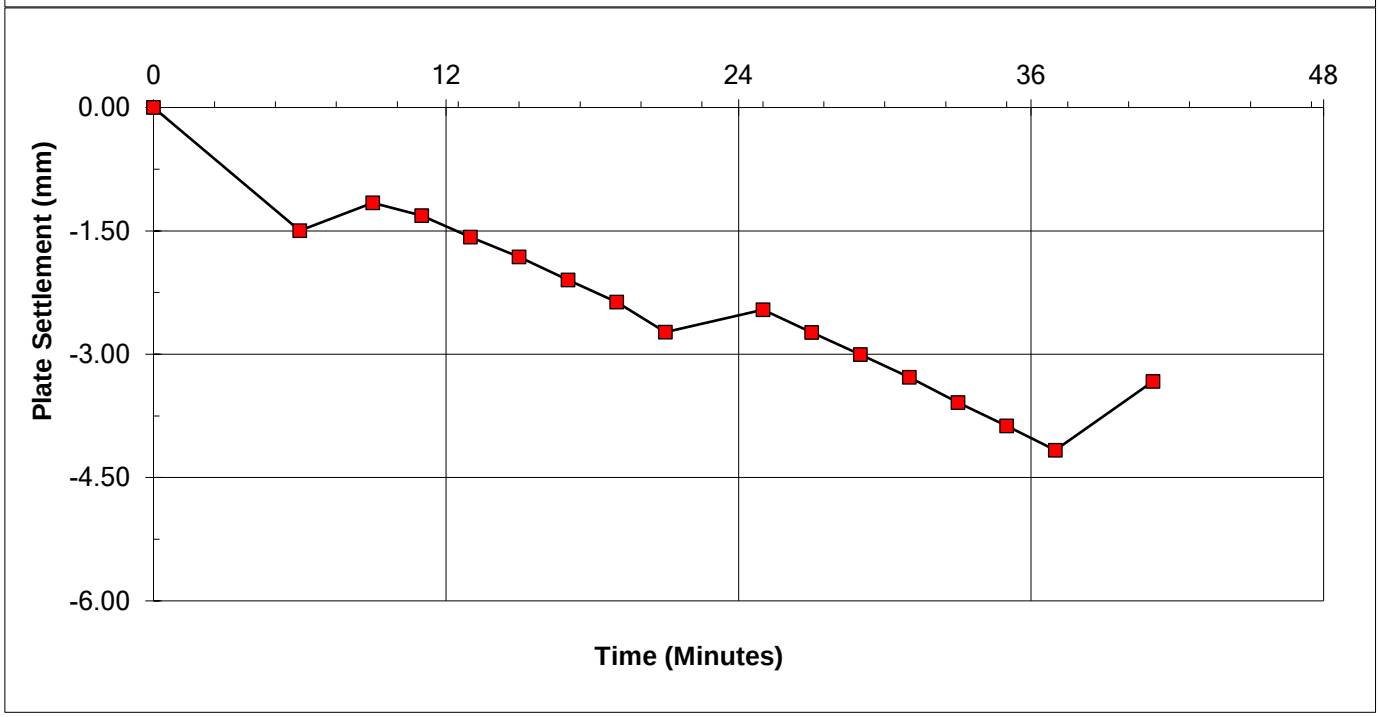
MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 27-Apr-23

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD

BS 1377 : Part 9 : Clause 2.2

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/3

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	26-Apr-23
DATE OF TEST	26-Apr-23	SAMPLED BY	Murray Rix
DATE TESTED	27-Apr-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124398	I9 L4	Clay Fill	2.20	1.98	11	100.1	3.2
		Maximum Dry Density (Mg/m^3)		1.98		(Advised by client)	
		Particle Density (Mg/m^3)		2.64		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 27-Apr-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/4
Date of Issue 05 May 2023
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	G8 L2	200	2.19	2.03	8.0	101.2	5.7
2	G8 L3	200	2.25	2.07	8.4	103.5	2.6
3	G8 L4	200	2.18	2.01	8.3	100.4	5.8
4	G7 L2	200	2.20	2.03	8.2	101.4	5.0
5	G7 L3	200	2.25	2.08	8.4	103.6	2.5
6	G7 L4	200	2.21	1.99	11	99.3	1.5
7	E7 L1	200	2.26	2.05	10	102.3	0.5
8	E7 L2	200	2.19	1.98	11	98.8	2.8
9	E7 L3	200	2.19	1.99	10	99.0	3.0
10	E7 L4	200	2.20	1.97	12	98.2	0.9
11	E8 L1	200	2.22	1.99	11	99.5	1.1
12	E8 L2	200	2.21	1.99	11	99.3	1.9
13	E8 L3	200	2.21	2.01	9.7	100.4	2.9
14	E8 L4	200	2.22	2.02	9.6	100.8	2.7
15	F7 L1	200	2.21	2.01	9.8	100.4	2.8
16	F7 L2	200	2.19	1.99	10	99.2	3.5
17	F7 L3	200	2.17	1.97	9.9	98.5	4.3
18	F7 L4	200	2.22	2.03	9.4	101.4	2.6
19	F8 L1	200	2.20	2.01	9.7	100.1	3.2
20	F8 L2	200	2.15	1.96	9.6	97.9	5.6
				Maximum Dry Density (Mg/m3)	2.01	(Advised by client)	
				Particle Density (Mg/m3)	2.60	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	F8 L3	200	2.17	1.99	8.8	99.2	5.8
22	F8 L4	200	2.20	2.01	9.4	100.5	3.5
23	F9 L1	200	2.21	2.03	8.8	101.2	4.0
24	F9 L2	200	2.20	2.03	8.6	101.3	4.4
25	F9 L3	200	2.19	2.01	9.0	100.2	4.5
26	F9 L4	200	2.19	2.01	9.1	100.3	4.3
27	G9 L2	200	2.17	2.00	8.6	99.7	5.9
28	G9 L3	200	2.14	1.95	10	97.0	5.6
29	G9 L4	200	2.17	1.97	10	98.2	4.4
30	G10 L1	200	2.15	1.95	9.9	97.4	5.5
31	G10 L2	200	2.16	1.94	11	96.9	3.8
32	G10 L3	200	2.14	1.96	9.2	98.0	6.3
33	G10 L4	200	2.20	2.03	8.6	101.2	4.3
34	G11 L1	200	2.19	2.00	9.7	99.7	3.6
35	G11 L2	200	2.20	2.01	9.6	100.3	3.3
36	G11 L3	200	2.19	2.01	9.1	100.1	4.4
37	G11 L4	200	2.21	2.03	8.5	101.5	4.3
38	H10 L1	200	2.20	2.02	8.9	100.9	4.0
39	H10 L2	200	2.11	1.90	11	94.8	5.9
40	H10 L3	200	2.18	2.00	9.3	99.5	4.5
				Maximum Dry Density (Mg/m3)	2.01	(Advised by client)	
				Particle Density (Mg/m3)	2.60	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
41	H10 L4	200	2.19	2.01	8.8	100.5	4.7
42	I10 L1	200	2.16	1.97	9.5	98.4	5.3
43	I10 L2	200	2.14	1.93	11	96.2	4.5
44	I10 L3	200	2.15	1.96	10	97.7	4.9
45	I10 L4	200	2.15	1.97	9.4	98.0	5.9

Maximum Dry Density (Mg/m3)	2.01	(Advised by client)
Particle Density (Mg/m3)	2.60	(Advised by client)
Results corrected for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/4
Date of Issue 05 May 2023
Page 1 of 3

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	G7 L2	200	2.20	2.03	8.2	101.4	5.0
2	G7 L3	200	2.25	2.08	8.4	103.6	2.5
3	G7 L4	200	2.21	1.99	11	99.3	1.5
4	E7 L1	200	2.26	2.05	10	102.3	0.5
5	E7 L2	200	2.19	1.98	11	98.8	2.8
6	E7 L3	200	2.19	1.99	10	99.0	3.0
7	E7 L4	200	2.20	1.97	12	98.2	0.9
8	E8 L1	200	2.22	1.99	11	99.5	1.1
9	E8 L2	200	2.21	1.99	11	99.3	1.9
10	E8 L3	200	2.21	2.01	9.7	100.4	2.9
11	E8 L4	200	2.22	2.02	9.6	100.8	2.7
12	F7 L1	200	2.21	2.01	9.8	100.4	2.8
13	F7 L2	200	2.19	1.99	10	99.2	3.5
14	F7 L3	200	2.17	1.97	9.9	98.5	4.3
15	F7 L4	200	2.22	2.03	9.4	101.4	2.6
16	F8 L1	200	2.20	2.01	9.7	100.1	3.2
17	F9 L1	200	2.21	2.03	8.8	101.2	4.0
18	F9 L2	200	2.20	2.03	8.6	101.3	4.4
19	F9 L3	200	2.19	2.01	9.0	100.2	4.5
20	F9 L4	200	2.19	2.01	9.1	100.3	4.3
				Maximum Dry Density (Mg/m3)	2.01	(Advised by client)	
				Particle Density (Mg/m3)	2.60	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	G11 L1	200	2.19	2.00	9.7	99.7	3.6
22	G11 L2	200	2.20	2.01	9.6	100.3	3.3
23	G11 L3	200	2.19	2.01	9.1	100.1	4.4
24	G11 L4	200	2.21	2.03	8.5	101.5	4.3
25	H10 L1	200	2.20	2.02	8.9	100.9	4.0
26	H10 L2	200	2.11	1.90	11	94.8	5.9
27	H10 L3	200	2.18	2.00	9.3	99.5	4.5
28	H10 L4	200	2.19	2.01	8.8	100.4	4.7
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	2.01	(Advised by client)	
				Particle Density (Mg/m3)	2.60	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/4A
Date of Issue 05 May 2023
Page 1 of 2

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	04-May-23	**JOB NUMBER**	MRN 4742/4A
MATERIAL	Clay		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	I10 L1	200	2.16	1.97	9.5	103.8	4.6
2	I10 L2	200	2.14	1.93	11	101.5	3.8
3	I10 L3	200	2.15	1.96	10	103.1	4.2
4	I10 L4	200	2.15	1.97	9.4	103.5	5.1
5	F8 L2	200	2.15	1.96	9.6	103.2	4.8
6	F8 L3	200	2.17	1.99	8.8	105.0	4.8
7	F8 L4	200	2.20	2.01	9.4	105.8	2.8
8	G8 L2	200	2.19	2.03	8.0	106.7	4.9
9	G8 L3	200	2.25	2.08	8.4	109.2	1.8
10	G8 L4	200	2.18	2.01	8.3	105.9	5.0
11	G9 L2	200	2.17	2.00	8.6	105.2	5.1
12	G9 L3	200	2.14	1.95	10	102.4	4.8
13	G9 L4	200	2.17	1.97	10	103.8	3.5
14	G10 L1	200	2.15	1.96	9.9	103.0	4.5
15	G10 L2	200	2.16	1.95	11	102.4	2.9
16	G10 L3	200	2.14	1.96	9.2	103.1	5.7
17	G10 L4	200	2.20	2.03	8.6	106.6	3.8
18							
19							
20							
				Maximum Dry Density (Mg/m3)	1.90	(Advised by client)	
				Particle Density (Mg/m3)	2.57	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 05-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/5
Date of Issue 09 May 2023
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, CORE CUTTER METHOD

BS 1377 : Part 9 : Clause 2.4

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/5

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	28-Apr-23
DATE OF TEST	28-Apr-23	SAMPLED BY	Client
DATE TESTED	02-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Sample Label / Site Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124712	I8 L1	Light Brown Clay	2.17	1.91	14	95.0	0.1
124713	I8 L2	Light Brown Clay	2.19	1.94	13	96.7	0.7
124714	I8 L3	Light Brown Clay	2.17	1.94	12	96.8	2.5
124715	I8 L4	Light Brown Clay	2.15	1.94	11	96.5	3.7
124716	H7 L1	Light Brown Clay	2.18	1.93	13	96.3	1.0
124717	H7 L2	Light Brown Clay	2.14	1.91	12	95.3	3.4
124718	H7 L3	Light Brown Clay	2.18	1.95	12	97.3	1.7
124719	H8 L1	Light Brown Clay	2.14	1.92	11	95.9	4.0
124720	H8 L2	Light Brown Clay	2.18	1.92	13	96.0	0.1
			Maximum Dry Density (Mg/m^3)	2.01		(Advised by client)	
			Particle Density (Mg/m^3)	2.60		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 09-May-23

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, CORE CUTTER METHOD

BS 1377 : Part 9 : Clause 2.4

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/5

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	28-Apr-23
DATE OF TEST	28-Apr-23	SAMPLED BY	Client
DATE TESTED	02-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Sample Label / Site Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124721	H8 L3	Light Brown Clay	2.18	1.91	14	95.1	-0.3
124722	H8 L4	Light Brown Clay	2.20	1.95	13	97.3	-0.2
124723	H8 L5	Light Brown Clay	2.21	1.98	12	98.9	0.5
124724	H8 L6	Light Brown Clay	2.17	1.92	13	95.7	0.9
124725	H9 L1	Light Brown Clay	2.13	1.93	11	96.1	5.5
124726	H L2	Light Brown Clay	2.18	1.92	14	95.8	0.1
124727	H9 L3	Light Brown Clay	2.16	1.92	13	95.8	2.0
124728	H9 L4	Light Brown Clay	2.16	1.90	14	94.9	1.0
124729	H9 L5	Light Brown Clay	2.14	1.91	12	95.5	3.5
		Maximum Dry Density (Mg/m^3)		2.01		(Advised by client)	
		Particle Density (Mg/m^3)		2.60		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 09-May-23

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, CORE CUTTER METHOD
BS 1377 : Part 9 : Clause 2.4
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/5

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	28-Apr-23
DATE OF TEST	28-Apr-23	SAMPLED BY	Client
DATE TESTED	02-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Sample Label / Site Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124730	H9 L6	Light Brown Clay	2.16	1.92	13	95.6	1.8
		Maximum Dry Density (Mg/m^3)		2.01		(Advised by client)	
		Particle Density (Mg/m^3)		2.60		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 09-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/6
Date of Issue 09 May 2023
Page 1 of 2

Approved Signatories

S J Hutchings, O P Davies

Notes

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD

BS 1377 : Part 9 : Clause 2.2

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/6

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	04-May-23
DATE OF TEST	04-May-23	SAMPLED BY	Murray Rix
DATE TESTED	05-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
124997	E7 L2	Clay Fill	2.18	1.95	12	97.0	1.6
124998	E8 L3	Clay Fill	2.19	1.99	10	99.0	3.6
1424999	G8 L4	Clay Fill	2.18	2.00	9.1	99.5	4.9
		Maximum Dry Density (Mg/m^3)		2.01		(Advised by client)	
		Particle Density (Mg/m^3)		2.60		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 09-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/7
Date of Issue 12 May 2023

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/7		
TEST LOCATION	H16	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	11-May-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Formation Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4819	4766	4807	4797	0.00	0.00	0.0
4680	4611	4636	4642	-1.55	31.00	109.6
4705	4671	4709	4695	-1.02	0.00	0.0
4674	4640	4675	4663	-1.34	17.00	60.1
4645	4611	4633	4630	-1.68	30.00	106.1
4614	4580	4601	4598	-1.99	40.00	141.5
4589	4551	4570	4570	-2.27	50.00	176.8
4558	4523	4541	4541	-2.57	65.00	229.9
4530	4493	4512	4512	-2.86	75.00	265.3
4684	4596	4635	4638	-1.59	0.00	0.0
4651	4567	4598	4605	-1.92	20.00	70.7
4622	4542	4565	4576	-2.21	30.00	106.1
4595	4516	4532	4548	-2.50	50.00	176.8
4567	4485	4505	4519	-2.78	65.00	229.9
4535	4454	4485	4491	-3.06	76.00	268.8
4513	4422	4443	4459	-3.38	88.00	311.2
4573	4482	4556	4537	-2.60	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	177	kPa
Modulus of subgrade reaction (k) =	141	MPa/m
Equivalent 762 mm plate reaction =	114	MPa/m
Equivalent CBR =	35.3	%
Surface Stiffness Modulus (E) =	172	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	238	kPa
Modulus of subgrade reaction (k) =	190	MPa/m
Equivalent 762 mm plate reaction =	153	MPa/m
Equivalent CBR =	59.0	%
Surface Stiffness Modulus (E) =	239	MN/m^2

Surface Stiffness Modulus Ratio =	1.4

DATE 12-May-23

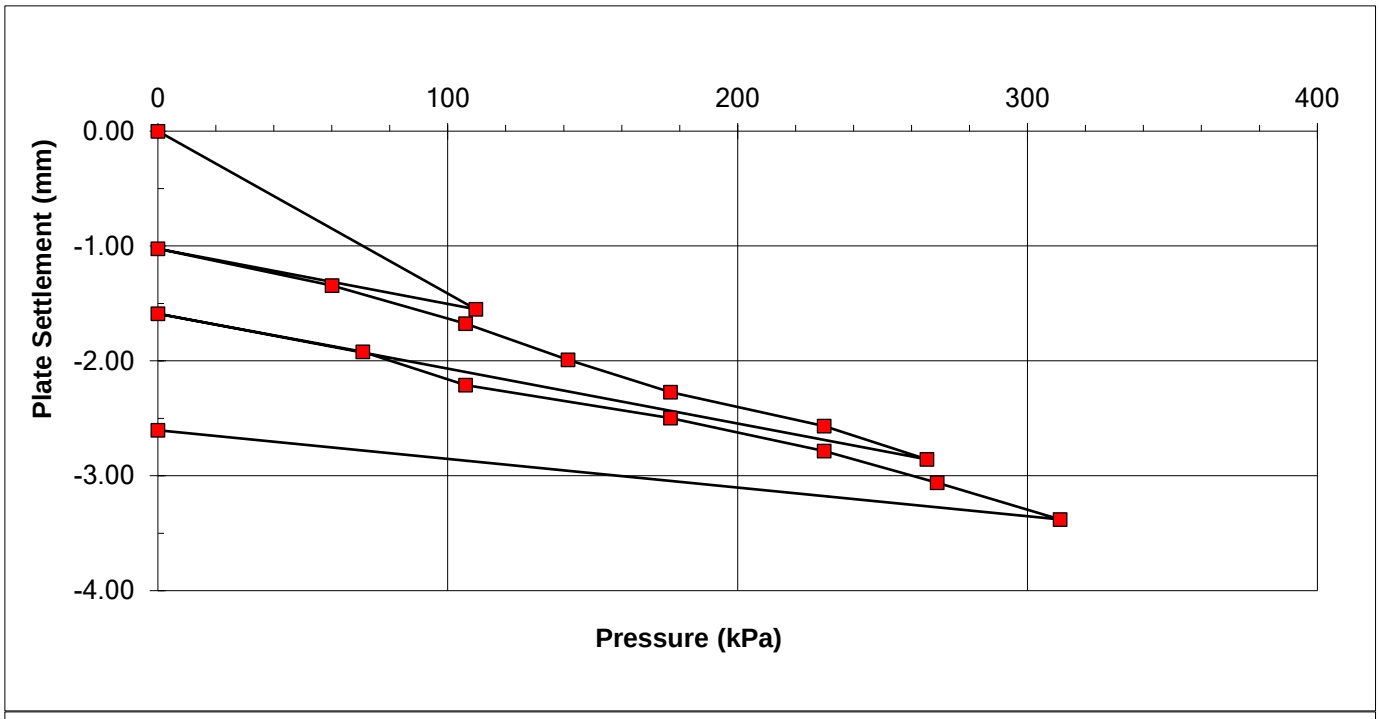
MURRAY RIX

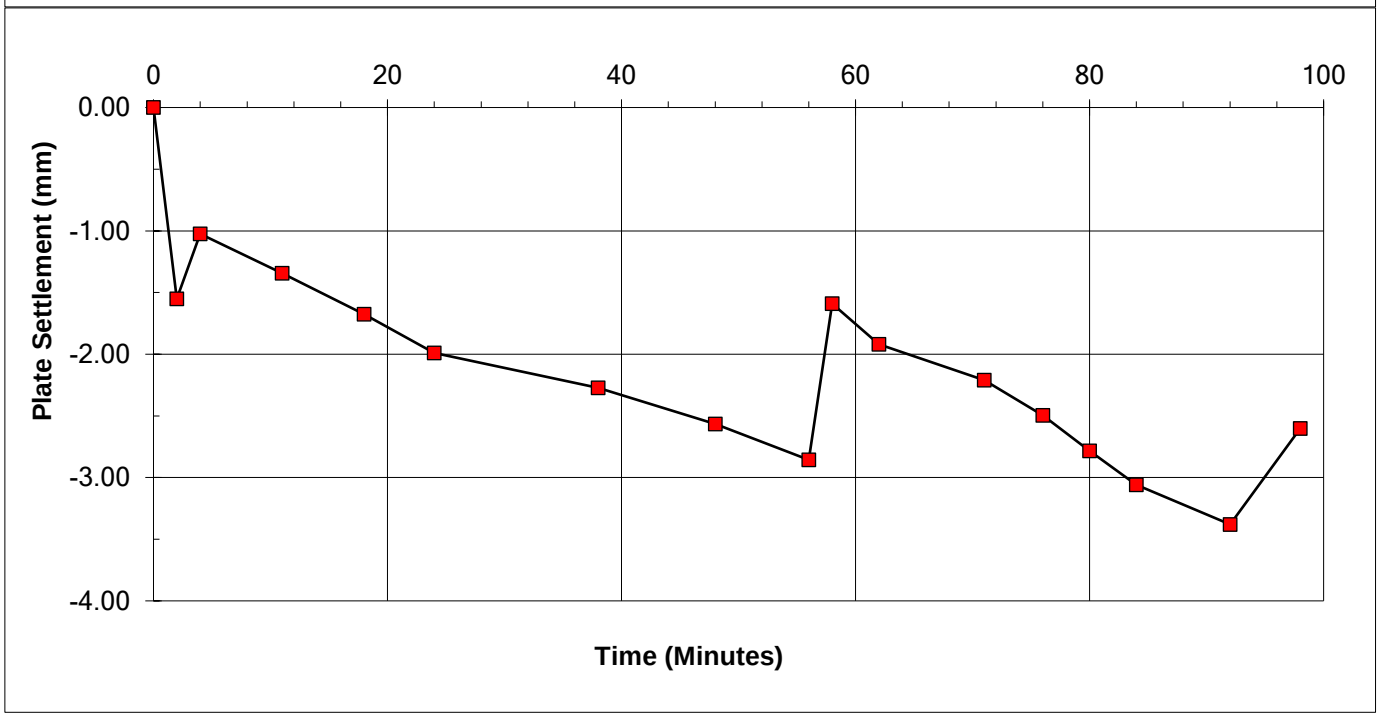
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 12-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/7		
TEST LOCATION	G19	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	11-May-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Formation Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4806	4801	4784	4797	0.00	0.00	0.0
4647	4633	4642	4641	-1.56	28.00	99.0
4698	4685	4709	4697	-1.00	0.00	0.0
4670	4652	4678	4667	-1.30	16.00	56.6
4639	4622	4650	4637	-1.60	29.00	102.6
4610	4592	4619	4607	-1.90	37.00	130.9
4582	4562	4594	4579	-2.18	48.00	169.8
4561	4532	4567	4553	-2.44	60.00	212.2
4531	4501	4536	4523	-2.74	71.00	251.1
4641	4629	4668	4646	-1.51	0.00	0.0
4612	4597	4638	4616	-1.81	22.00	77.8
4581	4567	4611	4586	-2.11	32.00	113.2
4551	4537	4589	4559	-2.38	44.00	155.6
4522	4509	4558	4530	-2.67	57.00	201.6
4496	4477	4530	4501	-2.96	68.00	240.5
4477	4454	4502	4478	-3.19	79.00	279.4
4624	4605	4642	4624	-1.73	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	181	kPa
Modulus of subgrade reaction (k) =	145	MPa/m
Equivalent 762 mm plate reaction =	117	MPa/m
Equivalent CBR =	36.8	%
Surface Stiffness Modulus (E) =	177	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	213	kPa
Modulus of subgrade reaction (k) =	171	MPa/m
Equivalent 762 mm plate reaction =	137	MPa/m
Equivalent CBR =	48.9	%
Surface Stiffness Modulus (E) =	212	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

DATE 12-May-23

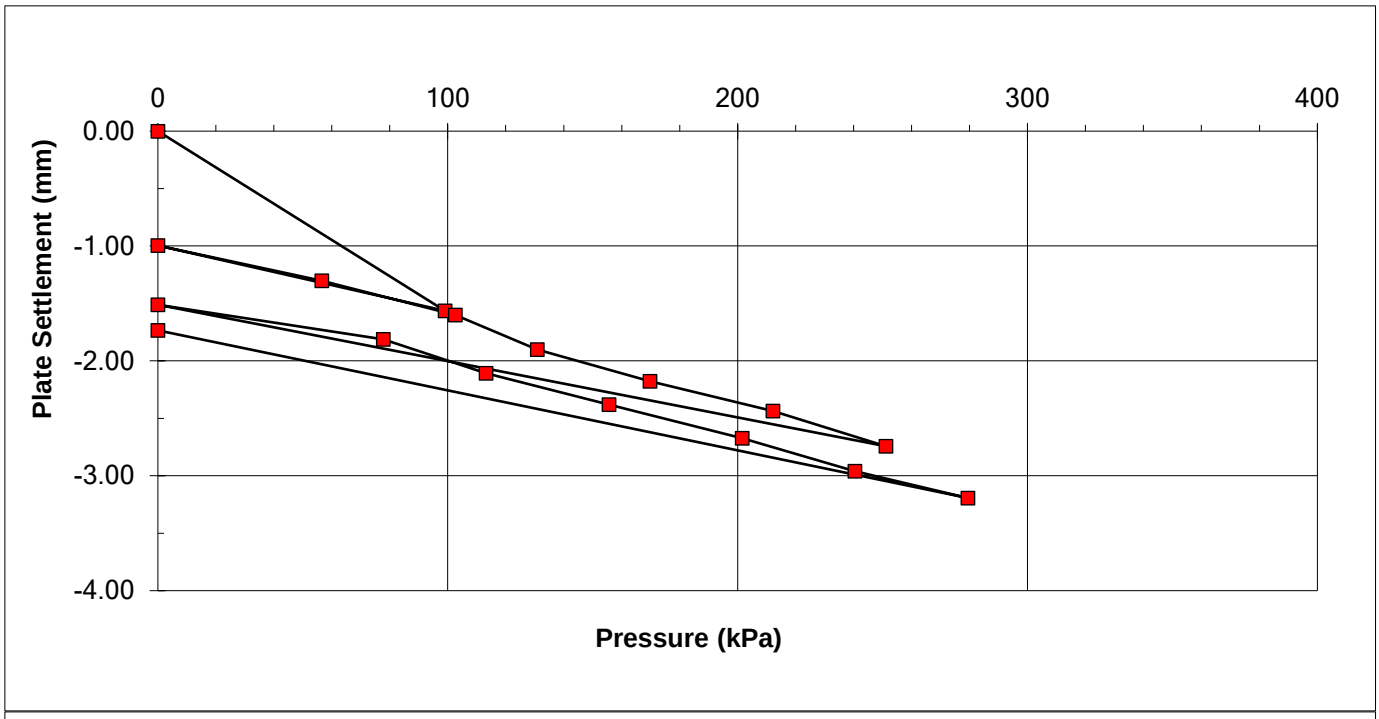
MURRAY RIX

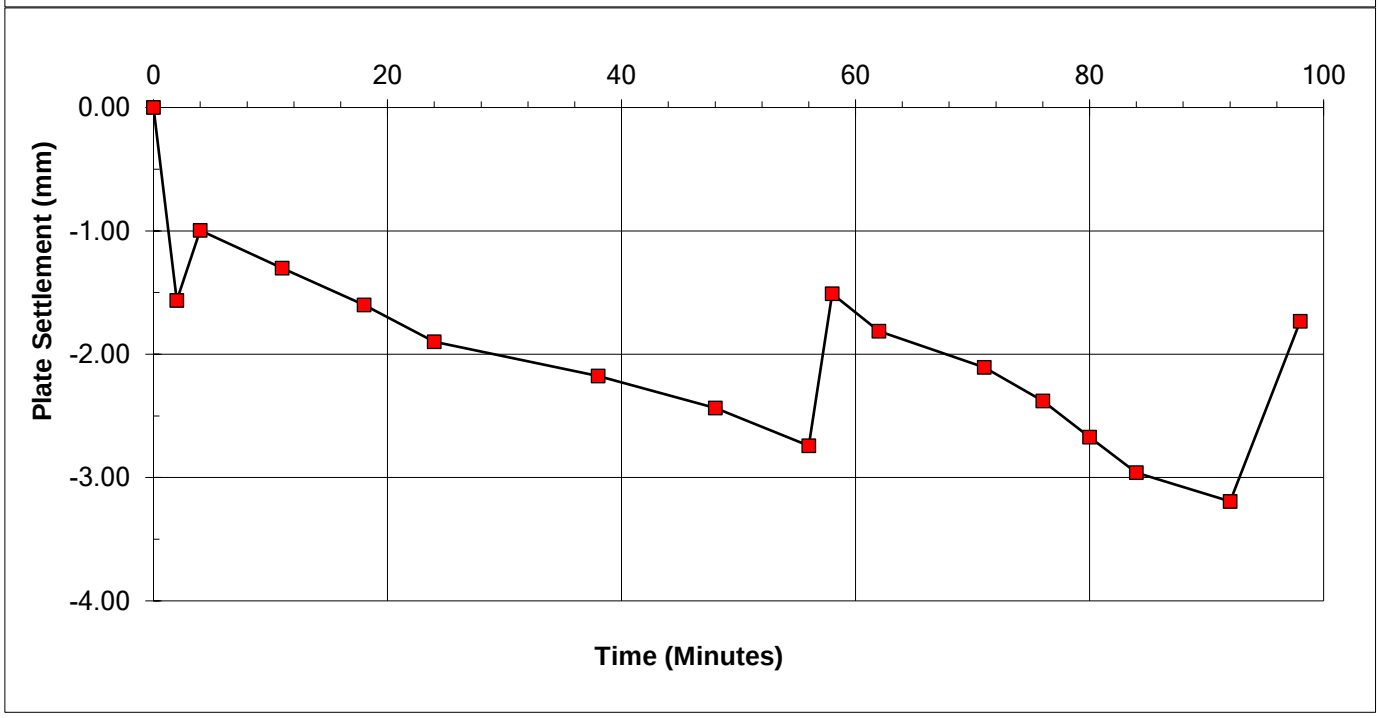
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 12-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/8
Date of Issue 15 May 2023

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	12-May-23	**JOB NUMBER**	MRN 4742/8
MATERIAL	Clay Fill		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	G8 L5	200	2.16	1.97	10	103.4	3.7
2	G8 L6	200	2.15	1.96	9.7	103.0	5.0
3	G8 L7	200	2.18	1.98	9.9	104.2	3.5
4	G9 L5	200	2.18	1.98	10	104.4	3.0
5	G9 L6	200	2.11	1.89	12	99.3	3.9
6	G9 L7	200	2.15	1.92	12	100.9	2.4
7	G9 L8	200	2.16	1.94	11	102.1	2.5
8	G9 L9	200	2.11	1.89	12	99.3	4.0
9	F8 L5	200	2.13	1.92	11	100.9	4.3
10	F8 L6	200	2.16	1.97	9.5	103.9	4.5
11	F8 L7	200	2.13	1.91	11	100.8	4.4
12	F8 L8	200	2.19	1.99	10	104.8	2.5
13	F9 L5	200	2.14	1.93	11	101.4	4.1
14	F9 L6	200	2.18	1.98	10	104.1	2.9
15	F9 L7	200	2.10	1.88	12	98.8	4.4
16	F9 L8	200	2.07	1.83	13	96.5	4.8
17	I9 L1	200	2.15	1.96	10	102.9	4.1
18	I9 L2	200	2.11	1.88	12	99.2	4.1
19	I9 L3	200	2.19	1.99	10	104.8	2.6
20	I9 L4	200	2.15	1.96	10	103.0	4.3
				Maximum Dry Density (Mg/m3)	1.90	(Advised by client)	
				Particle Density (Mg/m3)	2.57	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	12-May-23	**JOB NUMBER**	MRN 4742/8
MATERIAL	Clay Fill		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	I9 L5	200	2.10	1.88	12	98.9	4.3
22	I9 L6	200	2.16	1.96	10	103.0	3.6
23	I9 L7	200	2.20	1.98	11	104.3	1.0
24	I9 L8	200	2.17	1.98	9.8	104.0	3.8
25	H11 L5	200	2.10	1.87	12	98.6	4.6
26	H11 L6	200	2.14	1.95	10	102.5	4.8
27	H11 L7	200	2.15	1.96	9.7	103.2	4.7
28	H11 L8	200	2.14	1.95	10	102.5	4.9
29	H11 L9	200	2.10	1.91	10	100.6	6.5
30	I11 L6	200	2.17	1.94	12	102.2	2.1
31	I11 L7	200	2.20	1.98	11	104.5	1.5
32	I11 L8	200	2.16	1.95	11	102.4	3.0
33	H12 L6	200	2.10	1.88	12	98.9	4.3
34	H12 L7	200	2.15	1.96	9.9	103.0	4.6
35	H12 L8	200	2.15	1.95	10	102.6	4.1
36	I12 L6	200	2.17	1.97	9.8	103.8	4.0
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.90	(Advised by client)	
				Particle Density (Mg/m3)	2.57	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 15-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/9
Date of Issue 16 May 2023

Approved Signatories

S J Hutchings, O P Davies

Notes

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5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/9

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	12-May-23
DATE OF TEST	12-May-23	SAMPLED BY	Murray Rix
DATE TESTED	15-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
125259	F9 L7	Clay Fill	2.15	1.96	10	103.2	4.1
125260	I11 L8	Clay Fill	2.10	1.88	12	98.9	4.3
125261	G8 L6	Clay Fill	2.16	1.97	9.8	103.7	4.0
		Maximum Dry Density (Mg/m^3)		1.90		(Advised by client)	
		Particle Density (Mg/m^3)		2.57		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 16-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/10
Date of Issue 18 May 2023
Page 1 of 7

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/10		
TEST LOCATION	F17	LOADING DEVICE	10 Tonne Enerpac Jack
TEST DATE	17-May-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Formation	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4038	4026	3831	3965	0.00	0.00	0.0
3887	3877	3667	3810	-1.55	14.00	49.5
3892	3900	3673	3822	-1.43	0.00	0.0
3860	3862	3641	3788	-1.77	9.00	31.8
3831	3827	3603	3754	-2.11	12.00	42.4
3795	3781	3576	3717	-2.48	15.00	53.1
3765	3750	3542	3686	-2.79	19.00	67.2
3742	3725	3514	3660	-3.05	22.00	77.8
3713	3690	3482	3628	-3.37	28.00	99.0
3842	3742	3515	3700	-2.65	0.00	0.0
3815	3712	3491	3673	-2.92	10.00	35.4
3782	3668	3458	3636	-3.29	14.00	49.5
3751	3642	3421	3605	-3.60	18.00	63.7
3715	3605	3397	3572	-3.93	21.00	74.3
3679	3569	3362	3537	-4.28	29.00	102.6
3645	3538	3328	3504	-4.61	33.00	116.7
3695	3595	3395	3562	-4.03	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	62	kPa
Modulus of subgrade reaction (k) =	50	MPa/m
Equivalent 762 mm plate reaction =	40	MPa/m
Equivalent CBR =	5.8	%
Surface Stiffness Modulus (E) =	54	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	74	kPa
Modulus of subgrade reaction (k) =	59	MPa/m
Equivalent 762 mm plate reaction =	47	MPa/m
Equivalent CBR =	7.7	%
Surface Stiffness Modulus (E) =	65	MN/m^2

Surface Stiffness Modulus Ratio =	1.2

DATE 18-May-23

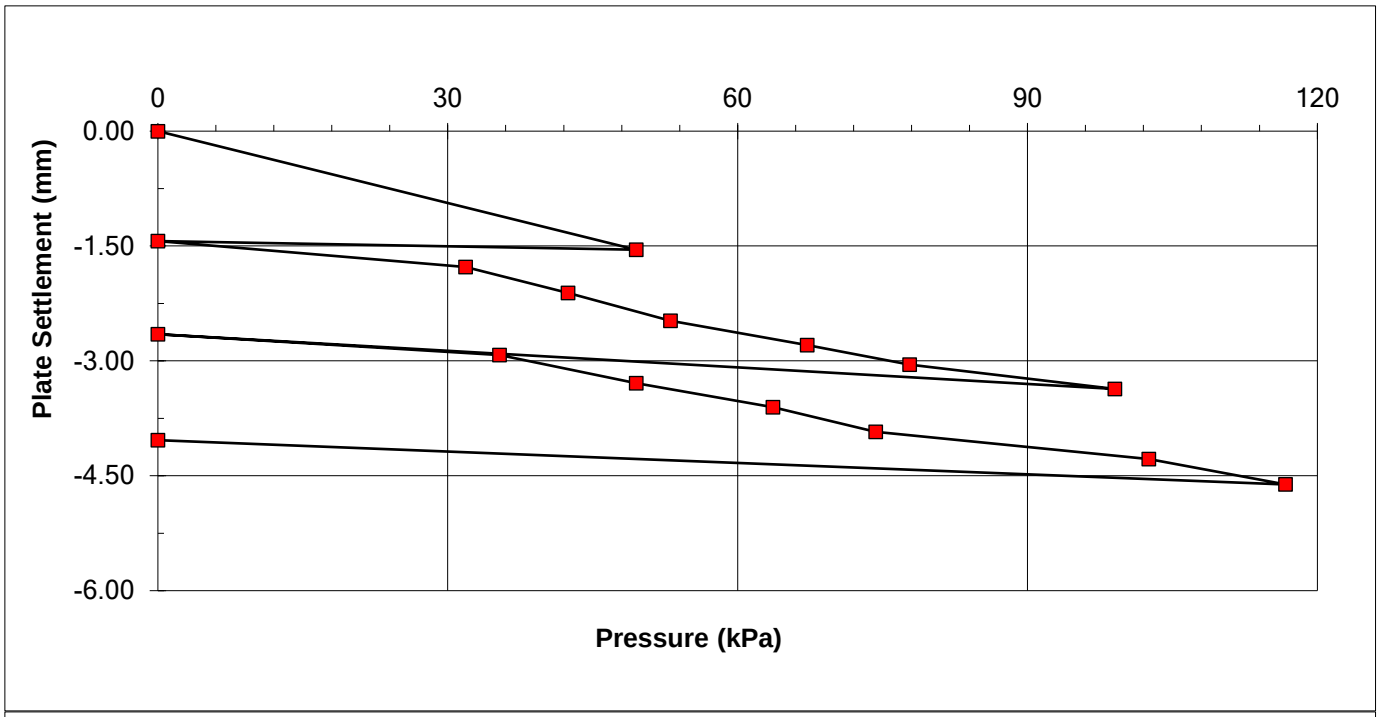
MURRAY RIX

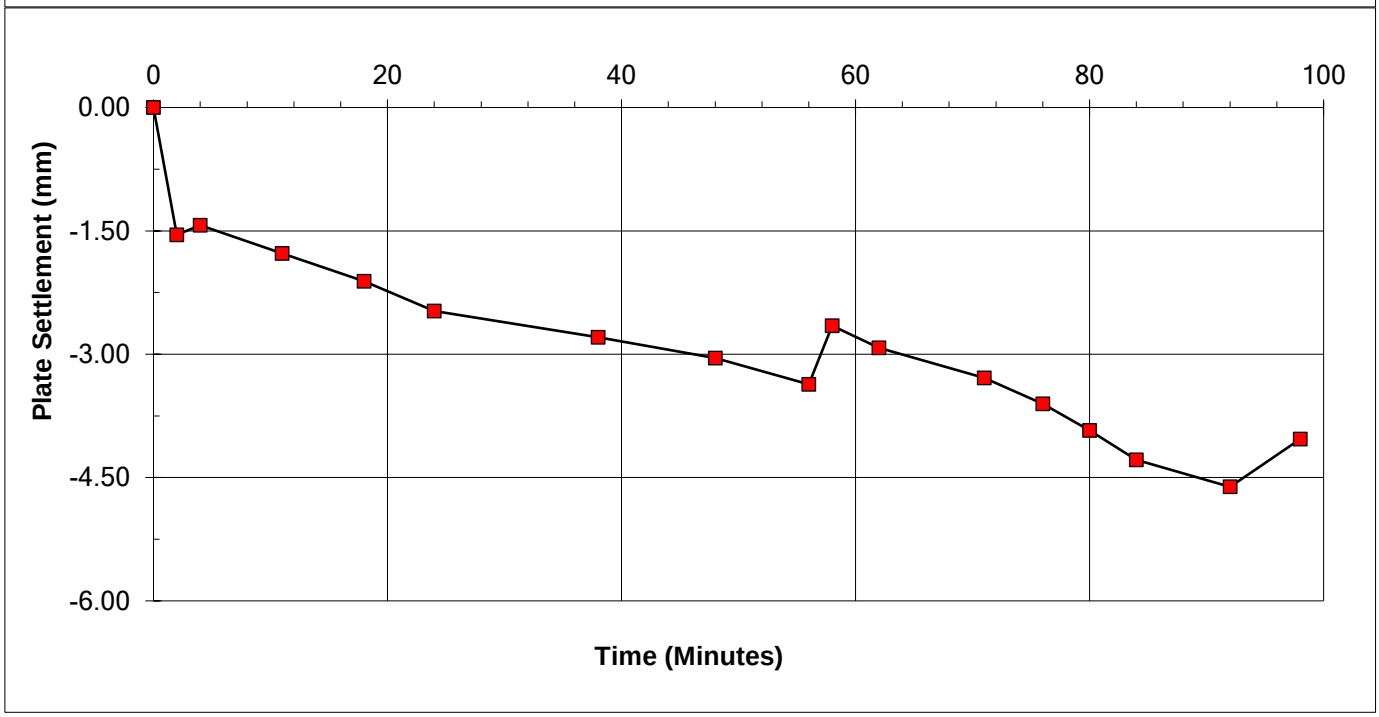
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 18-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc			
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP			
JOB NUMBER	MRN 4742/10			
TEST LOCATION	F16	LOADING DEVICE	10 Tonne Enerpac Jack	
TEST DATE	17-May-23	PLATE SIZE (mm)	600 diameter	
TEST DEPTH	Formation	REACTION LOAD USED	Site Plant	
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required	

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
3542	3361	4628	3844	0.00	0.00	0.0
3395	3210	4461	3689	-1.55	12.00	42.4
3458	3268	4508	3745	-0.99	0.00	0.0
3422	3238	4478	3713	-1.31	10.00	35.4
3392	3204	4442	3679	-1.64	13.00	46.0
3358	3165	4408	3644	-2.00	18.00	63.7
3321	3135	4372	3609	-2.34	21.00	74.3
3285	3100	4342	3576	-2.68	24.00	84.9
3255	3062	4308	3542	-3.02	27.00	95.5
3338	3121	4410	3623	-2.21	0.00	0.0
3310	3085	4372	3589	-2.55	10.00	35.4
3283	3054	4341	3559	-2.84	14.00	49.5
3254	3023	4305	3527	-3.16	19.00	67.2
3221	2992	4276	3496	-3.47	22.00	77.8
3183	2962	4245	3463	-3.80	28.00	99.0
3154	2932	4215	3434	-4.10	34.00	120.3
3211	2988	4265	3488	-3.56	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	71	kPa
Modulus of subgrade reaction (k) =	57	MPa/m
Equivalent 762 mm plate reaction =	46	MPa/m
Equivalent CBR =	7.3	%
Surface Stiffness Modulus (E) =	63	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	77	kPa
Modulus of subgrade reaction (k) =	62	MPa/m
Equivalent 762 mm plate reaction =	50	MPa/m
Equivalent CBR =	8.4	%
Surface Stiffness Modulus (E) =	69	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 18-May-23

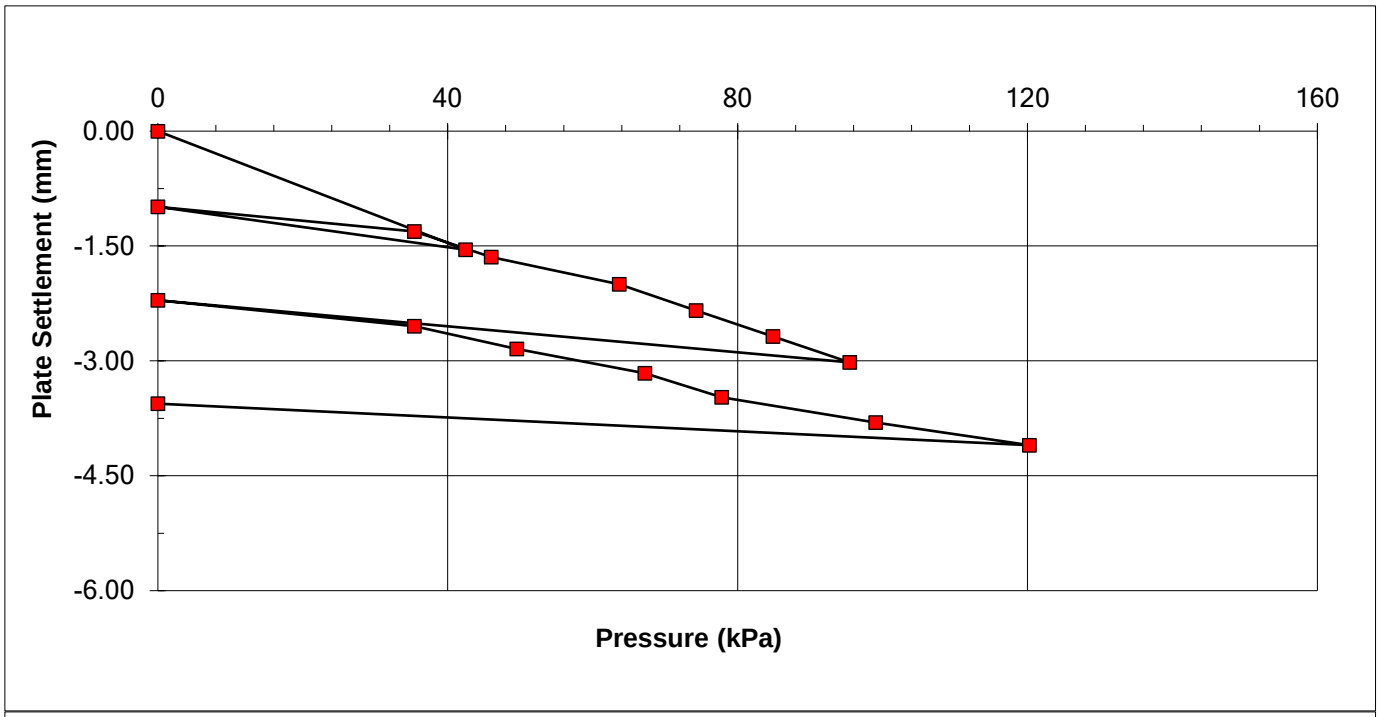
MURRAY RIX

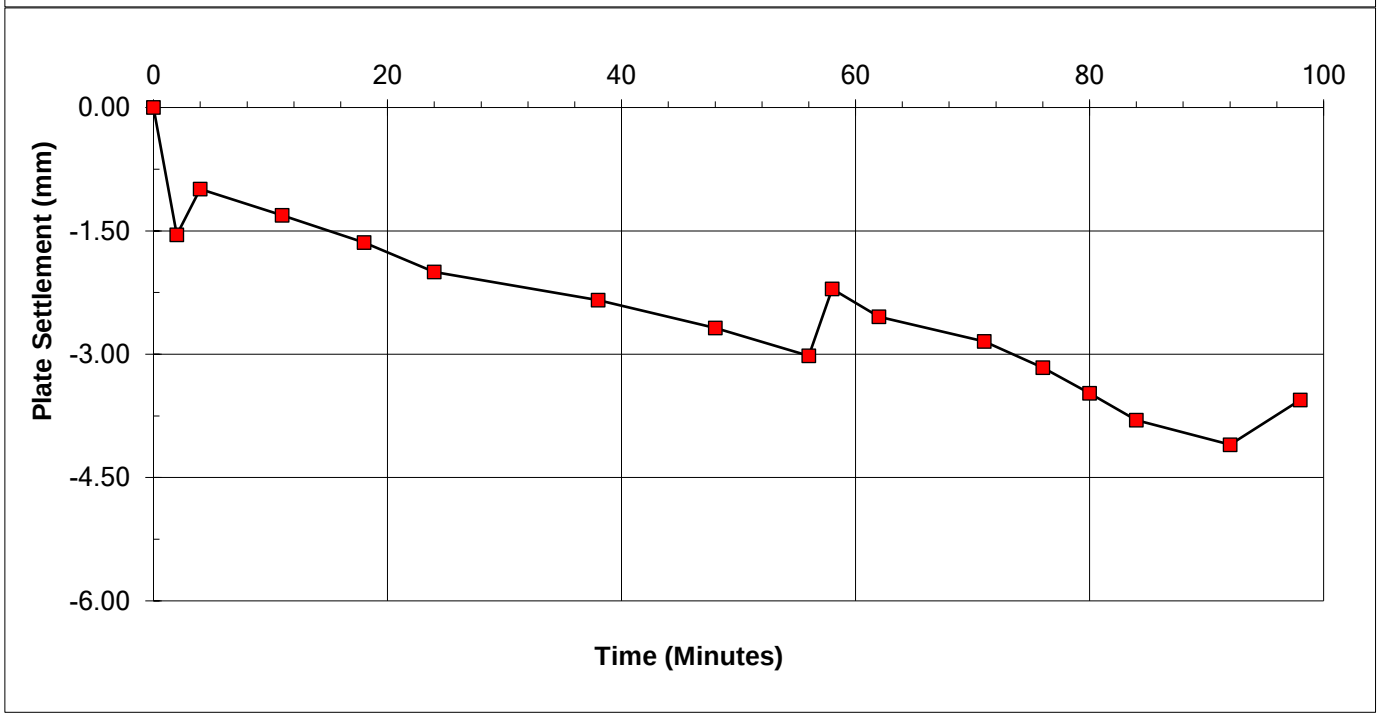
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 18-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/10		
TEST LOCATION	G17	LOADING DEVICE	10 Tonne Enerpac Jack
TEST DATE	17-May-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Formation	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Clay	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4036	3428	3842	3769	0.00	0.00	0.0
3980	3265	3698	3648	-1.21	15.00	53.1
4008	3285	3728	3674	-0.95	0.00	0.0
3980	3255	3689	3641	-1.27	9.00	31.8
3944	3225	3651	3607	-1.62	15.00	53.1
3913	3185	3615	3571	-1.98	19.00	67.2
3885	3158	3592	3545	-2.24	23.00	81.3
3852	3124	3561	3512	-2.56	26.00	92.0
3823	3092	3532	3482	-2.86	30.00	106.1
3881	3158	3608	3549	-2.20	0.00	0.0
3853	3121	3572	3515	-2.53	13.00	46.0
3823	3092	3543	3486	-2.83	17.00	60.1
3788	3058	3508	3451	-3.17	24.00	84.9
3751	3035	3472	3419	-3.49	29.00	102.6
3722	3005	3442	3390	-3.79	32.00	113.2
3683	2965	3403	3350	-4.18	34.00	120.3
3748	3021	3468	3412	-3.56	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	79	kPa
Modulus of subgrade reaction (k) =	63	MPa/m
Equivalent 762 mm plate reaction =	51	MPa/m
Equivalent CBR =	8.8	%
Surface Stiffness Modulus (E) =	71	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	100	kPa
Modulus of subgrade reaction (k) =	80	MPa/m
Equivalent 762 mm plate reaction =	64	MPa/m
Equivalent CBR =	13.1	%
Surface Stiffness Modulus (E) =	91	MN/m^2

Surface Stiffness Modulus Ratio =	1.3

DATE 18-May-23

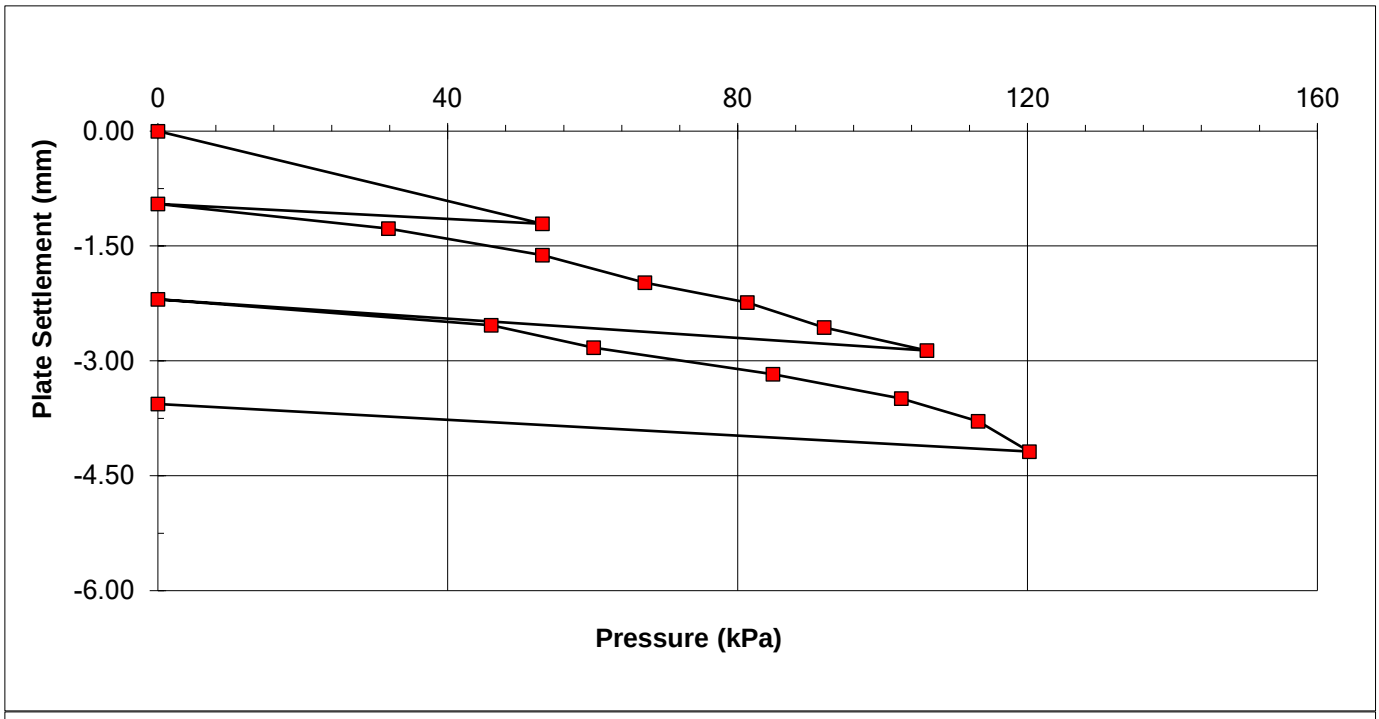
MURRAY RIX

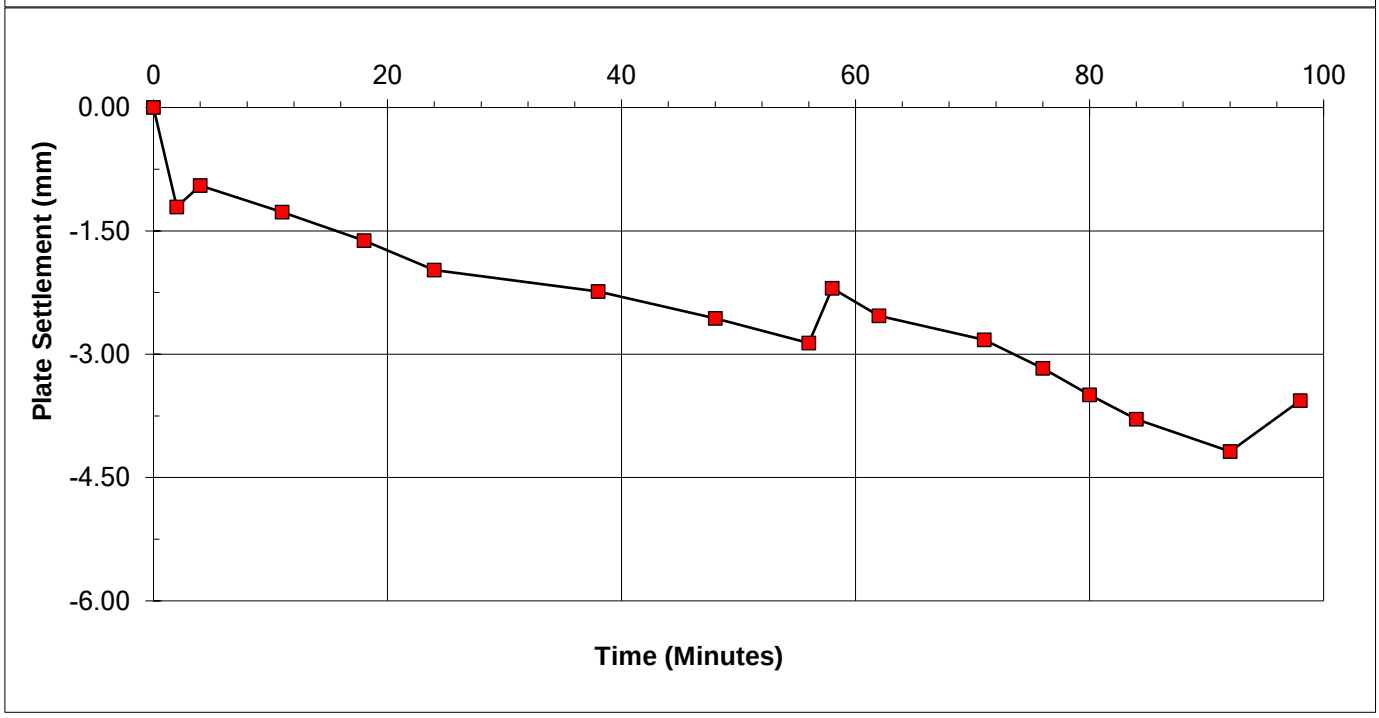
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 18-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/11
Date of Issue 11 May 2023
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	18-May-23	**JOB NUMBER**	MRN 4742/11
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	A15 L9	175	1.85	1.62	14	101.1	9.7
2	A15 L10	175	1.83	1.59	15	99.3	9.6
3	A15 L11	175	1.80	1.54	17	96.2	9.7
4	A1 L9	175	1.80	1.53	18	95.3	9.0
5	A16 L10	175	1.80	1.54	17	96.4	9.5
6	A16 L11	175	1.82	1.57	16	98.3	9.3
7	A17 L11	175	1.83	1.57	16	98.4	9.2
8	A17 L12	175	1.88	1.65	14	103.4	8.6
9	A18 L11	175	1.86	1.63	14	101.6	9.3
10	A18 L12	175	1.85	1.62	14	101.2	9.9
11	A18 L13	175	1.87	1.64	14	102.5	9.0
12	A18 L14	175	1.86	1.64	13	102.6	9.8
13	A19 L11	175	1.82	1.57	16	98.1	9.4
14	A19 L12	175	1.80	1.54	17	96.0	9.8
15	A19 L13	175	1.81	1.55	17	96.7	9.2
16	A19 L14	175	1.81	1.56	16	97.7	9.9
17	B19 L11	175	1.84	1.60	15	100.1	9.3
18	B19 L12	175	1.85	1.62	14	101.3	9.8
19	B19 L13	175	1.82	1.57	16	98.1	9.5
20	B18 L11	175	1.87	1.65	13	103.0	9.6
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	18-May-23	**JOB NUMBER**	MRN 4742/11
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	B18 L12	175	1.88	1.65	13	103.4	9.0
22	B18 L13	175	1.81	1.56	16	97.6	9.8
23	B17 L10	175	1.81	1.55	17	96.9	9.8
24	B17 L11	175	1.86	1.63	14	102.2	9.7
25	B17 L12	175	1.85	1.63	14	101.8	10.0
26	B16 L11	175	1.83	1.59	15	99.5	9.8
27	B16 L12	175	1.81	1.54	17	96.5	9.4
28	B15 L9	175	1.86	1.61	16	100.4	7.3
29	B15 L10	175	1.80	1.53	18	95.7	9.4
30	B15 L11	175	1.83	1.57	17	98.2	8.6
31	B13 L2	175	1.81	1.56	16	97.6	9.9
32	B13 L3	175	1.82	1.57	16	98.0	9.6
33	B13 L4	175	1.84	1.60	15	100.0	9.3
34	B13 L5	175	1.80	1.54	17	96.3	9.6
35	B13 L6	175	1.84	1.60	15	99.7	9.6
36	B13 L7	175	1.83	1.56	17	97.5	8.4
37	B13 L8	175	1.81	1.55	17	96.8	9.2
38	B13 L9	175	1.85	1.61	15	100.5	8.9
39	B13 L10	175	1.84	1.60	15	99.8	9.5
40	B13 L11	175	1.84	1.60	15	99.7	9.6
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	18-May-23	**JOB NUMBER**	MRN 4742/11
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
41	B13 L12	175	1.81	1.54	17	96.4	9.5
42	B13 L13	175	1.81	1.54	17	96.6	9.4
43	B13 L14	175	1.82	1.57	16	97.9	9.7
44							
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
					Maximum Dry Density (Mg/m3)	1.60	(Advised by client)
					Particle Density (Mg/m3)	2.40	(Advised by client)
					Results corrected for NDG calibration/correlation to site materials	Yes	

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 11-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/12
Date of Issue 23 May 2023
Page 1 of 2

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD

BS 1377 : Part 9 : Clause 2.2

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/12

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	18-May-23
DATE OF TEST	18-May-23	SAMPLED BY	Murray Rix
DATE TESTED	19-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
125475	A19 L14	Dark Grey Gravel Sand	1.81	1.56	16	97.3	9.8
125476	B19 L13	Dark Grey Gravel Sand	1.82	1.57	16	98.1	9.5
		Maximum Dry Density (Mg/m^3)		1.60		(Advised by client)	
		Particle Density (Mg/m^3)		2.40		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/13
Date of Issue 23 May 2023
Page 1 of 5

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD
BS 1377 : Part 9 : Clause 2.2
MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/13

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	18-May-23
DATE OF TEST	18-May-23	SAMPLED BY	Murray Rix
DATE TESTED	19-May-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
125644	B14 L12	Dark Grey Gravelly Sand	1.88	1.64	15	102.5	7.1
125645	C18 L8	Dark Grey Gravelly Sand	1.90	1.64	16	102.7	5.4
125646	C19 L11	Dark Grey Gravelly Sand	1.82	1.56	17	97.5	8.5
125647	D15 L6	Dark Grey Gravelly Sand	1.85	1.60	16	100.3	7.7
		Maximum Dry Density (Mg/m^3)		1.60		(Advised by client)	
		Particle Density (Mg/m^3)		2.40		(Advised by client)	

COMMENT / ANOMALIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	19-May-23	**JOB NUMBER**	MRN 4742/13
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	B14 L2	175	1.84	1.60	15	99.8	9.5
2	B14 L3	175	1.85	1.60	15	100.3	9.1
3	B14 L4	175	1.86	1.63	14	102.1	9.1
4	B14 L5	175	1.87	1.64	14	102.5	8.9
5	B14 L6	175	1.87	1.62	15	101.3	8.0
6	B14 L7	175	1.84	1.60	15	100.2	9.2
7	B14 L8	175	1.85	1.62	14	101.0	9.7
8	B14 L9	175	1.83	1.58	16	98.4	9.2
9	B14 L10	175	1.84	1.60	15	100.1	9.2
10	B14 L11	175	1.84	1.60	15	100.1	9.3
11	B14 L12	175	1.85	1.63	14	102.0	9.8
12	C15 L7	175	1.83	1.58	16	98.6	9.1
13	C15 L8	175	1.83	1.59	15	99.5	9.8
14	C15 L9	175	1.83	1.57	17	98.0	8.0
15	C15 L10	175	1.83	1.57	16	98.4	9.2
16	C15 L11	175	1.86	1.62	15	101.5	8.5
17	C16 L9	175	1.85	1.62	14	101.0	9.6
18	C16 L10	175	1.79	1.51	19	94.1	8.6
19	C16 L11	175	1.81	1.53	18	95.9	8.5
20	C17 L9	175	1.82	1.56	17	97.5	8.5
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	19-May-23	**JOB NUMBER**	MRN 4742/13
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	C17 L10	175	1.83	1.58	16	98.6	9.1
22	C17 L11	175	1.85	1.61	15	100.7	8.7
23	C18 L8	175	1.80	1.53	18	95.3	9.0
24	C18 L9	175	1.82	1.54	18	96.4	8.0
25	C18 L10	175	1.82	1.57	16	98.0	9.6
26	C18 L11	175	1.81	1.55	17	96.7	9.2
27	C19 L11	175	1.82	1.57	16	98.1	9.5
28	C20 L11	175	1.85	1.59	16	99.5	8.2
29	C20 L12	175	1.82	1.57	16	97.8	9.7
30	C20 L13	175	1.80	1.54	17	96.3	9.6
31	D15 L1	175	1.80	1.53	18	95.3	9.0
32	D15 L2	175	1.81	1.53	18	95.9	8.5
33	D15 L3	175	1.80	1.54	17	96.2	9.7
34	D15 L4	175	1.81	1.55	17	96.7	9.2
35	D15 L5	175	1.82	1.56	17	97.2	8.7
36	D15 L6	175	1.82	1.56	17	97.2	8.7
37	D18 L10	175	1.81	1.53	18	95.9	8.5
38	D18 L11	175	1.80	1.54	17	96.2	9.7
39							
40							
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	19-May-23	**JOB NUMBER**	MRN 4742/13
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
41	D19 L11	175	1.82	1.53	19	95.4	7.4
42	D20 L11	175	1.80	1.54	17	96.2	9.7
43	D20 L12	175	1.82	1.56	17	97.2	8.7
44	D20 L13	175	1.81	1.53	18	95.9	8.5
45	D20 L14	175	1.80	1.54	17	96.2	9.7
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/14
Date of Issue 23 May 2023
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	22-May-23	**JOB NUMBER**	MRN 4742/14
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	F20 L5	175	1.83	1.56	17	97.8	8.2
2	F19 L5	175	1.82	1.57	16	98.1	9.5
3	F19 L6	200	1.83	1.54	19	96.1	6.7
4	F18 L5	175	1.80	1.53	18	95.3	9.0
5	F18 L6	200	1.83	1.56	17	97.8	8.2
6	F17 L5	175	1.85	1.61	15	100.4	9.0
7	F16 L1	175	1.82	1.53	19	95.6	7.2
8	F16 L2	200	1.81	1.55	17	96.7	9.2
9	F16 L3	225	1.80	1.53	18	95.3	9.0
10	F16 L4	175	1.82	1.53	19	95.6	7.2
11	F16 L5	200	1.81	1.53	18	95.9	8.5
12	F15 L1	175	1.87	1.57	19	98.2	4.7
13	F15 L2	200	1.84	1.57	17	98.3	7.7
14	F15 L3	175	1.80	1.53	18	95.3	9.0
15	F15 L4	200	1.81	1.52	19	95.1	7.7
16	F15 L5	225	1.84	1.57	17	98.3	7.7
17	E13 L6	175	1.88	1.59	18	99.6	4.9
18	E13 L7	200	1.83	1.58	16	98.4	9.2
19	E13 L8	225	1.82	1.56	17	97.3	8.7
20	E14 L6	175	1.84	1.56	18	97.5	7.0
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	22-May-23	**JOB NUMBER**	MRN 4742/14
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	E15 L1	175	1.82	1.56	17	97.2	8.7
22	E15 L2	200	1.89	1.60	18	100.1	4.4
23	E15 L3	225	1.82	1.53	19	95.6	7.2
24	E15 L4	175	1.81	1.55	17	96.7	9.2
25	E15 L5	200	1.84	1.56	18	97.5	7.0
26	E8 L5	175	1.80	1.54	17	96.0	9.9
27	E8 L6	200	1.82	1.53	19	95.6	7.2
28	E8 L7	225	1.86	1.56	19	97.7	5.2
29	E18 L4	175	1.84	1.57	17	98.3	7.7
30	E18 L5	200	1.81	1.53	18	95.9	8.5
31	E18 L6	225	1.85	1.58	17	98.8	7.2
32	C14 L6	175	1.89	1.63	16	101.8	6.0
33	D9 L7	200	1.87	1.58	18	99.0	5.4
34	D12 L10	225	1.81	1.52	19	95.0	7.8
35	E19 L3	175	1.83	1.56	17	97.8	8.2
36	E19 L5	200	1.81	1.55	17	96.7	9.2
37	E19 L6	225	1.84	1.56	18	97.5	7.0
38	E14 L1	175	1.80	1.54	17	96.2	9.7
39	E13 L3	200	1.83	1.54	19	96.1	6.7
40	E14 L4	225	1.80	1.53	18	95.3	9.0
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	22-May-23	**JOB NUMBER**	MRN 4742/14
MATERIAL	Dark Grey Gravelly Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
41	E20 L2	175	1.82	1.54	18	96.4	8.0
42	E20 L5	200	1.81	1.55	17	96.7	9.2
43	E20 L6	225	1.82	1.56	17	97.2	8.7
44	C17 L7	175	1.81	1.52	19	95.1	7.7
45	C18 L8	175	1.83	1.55	18	96.9	7.5
46	D9 L6	175	1.81	1.55	17	96.7	9.2
47	D17 L7	175	1.81	1.55	17	96.7	9.2
48	C15 L4	175	1.82	1.53	19	95.6	7.2
49	G15 L1	175	1.88	1.60	17	100.2	5.9
50	G15 L2	200	1.81	1.53	18	95.9	8.5
51	G15 L3	225	1.82	1.56	17	97.5	8.5
52	G15 L4	175	1.80	1.53	18	95.3	9.0
53	G15 L5	200	1.84	1.56	18	97.5	7.0
54	G15 L6	225	1.81	1.53	18	95.9	8.5
55							
56							
57							
58							
59							
60							
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME O.P. Davies BA (Hons) (Laboratory Manager) SIGNED DATE 23-May-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/15
Date of Issue 01 June 2023

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

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MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	31-May-23	**JOB NUMBER**	MRN 4742/15
MATERIAL	Dark Grey Gravel Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	G17 L1	175	1.82	1.53	19	95.7	7.5
2	G17 L2	175	1.83	1.53	20	95.5	6.0
3	G17 L3	175	1.83	1.52	20	95.2	6.2
4	G17 L4	175	1.84	1.55	18	96.9	6.9
5	G17 L5	175	1.81	1.53	19	95.5	7.8
6	G18 L1	175	1.88	1.57	20	98.0	3.5
7	G18 L2	175	1.88	1.57	20	97.9	3.9
8	G18 L3	175	1.92	1.61	19	100.8	2.5
9	G18 L4	175	1.92	1.63	17	102.1	3.7
10	G18 L5	175	1.92	1.62	18	101.3	3.0
11	G18 L6	175	1.80	1.54	17	96.2	9.7
12	G19 L5	175	1.81	1.55	17	96.7	9.2
13	H17 L1	175	1.81	1.55	17	96.8	9.1
14	H17 L2	175	1.84	1.55	19	96.8	6.0
15	H17 L3	175	1.83	1.59	15	99.4	9.9
16	H17 L4	175	1.83	1.58	16	98.6	9.0
17	H17 L5	175	1.84	1.60	15	100.0	9.3
18	H17 L6	175	1.81	1.55	17	96.7	9.2
19	H18 L1	175	1.80	1.54	17	96.2	9.7
20	H18 L2	175	1.82	1.54	18	96.4	8.0
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 01-Jun-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	31-May-23	**JOB NUMBER**	MRN 4742/15
MATERIAL	Dark Grey Gravel Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	H18 L3	175	1.83	1.58	16	98.6	9.0
22	H18 L4	175	1.84	1.56	18	97.5	7.0
23	H18 L5	175	1.81	1.55	17	96.7	9.2
24	H19 L1	175	1.82	1.57	16	98.3	9.7
25	H19 L2	175	1.88	1.66	13	103.9	8.8
26	H19 L3	175	1.89	1.66	14	103.7	7.9
27	H19 L4	175	1.88	1.65	14	102.9	8.6
28	H19 L5	175	1.85	1.62	14	101.1	9.3
29	H20 L1	175	1.87	1.63	15	102.0	7.8
30	H20 L2	175	1.86	1.62	15	101.4	8.7
31	H20 L3	175	1.88	1.63	16	101.6	6.4
32	H20 L4	175	1.88	1.58	19	98.7	3.7
33	H20 L5	175	1.88	1.62	16	101.4	6.6
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 01-Jun-23

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client VHE Construction Plc

Address 6 Newton Business Park
Thorncliffe Park Estate
Sheffield
South Yorkshire
S35 2PH

Contract 808 -
Former Tarmac Manufacturing Plant,
Stopes Road, Bolton BL3 1NP

Job Number MRN 4742/16
Date of Issue 05 June 2023
Page 1 of 8

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	02-Jun-23	**JOB NUMBER**	MRN 4742/16
MATERIAL	Dark Grey Gravel Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
1	D20 L1	200	1.91	1.62	18	101.3	3.7
2	D20 L3	200	1.86	1.57	18	98.0	6.0
3	D20 L4	200	1.88	1.61	17	100.7	6.1
4	D20 L5	200	1.87	1.59	17	99.5	6.2
5	E7 L5	200	1.94	1.70	14	106.0	4.8
6	E7 L6	200	1.93	1.69	14	105.9	5.4
7	E13 L3	200	1.92	1.67	16	104.1	4.7
8	E13 L4	200	1.92	1.68	15	105.0	5.6
9	G10 L5	200	1.92	1.65	16	103.1	4.6
10	G10 L6	200	1.92	1.66	15	104.0	5.4
11	G10 L7	200	1.92	1.65	16	103.4	4.6
12	G10 L8	200	1.93	1.67	16	104.2	4.7
13	G10 L9	200	1.91	1.64	16	102.5	4.9
14	G10 L10	200	1.84	1.57	17	97.8	7.5
15	G11 L5	200	1.81	1.52	19	95.2	7.7
16	G11 L6	200	1.82	1.54	18	96.5	8.4
17	G11 L7	200	1.83	1.56	17	97.6	8.5
18	G13 L6	200	1.84	1.57	17	98.3	8.2
19	G13 L7	200	1.91	1.68	14	105.0	7.0
20	H10 L5	200	1.85	1.61	15	100.4	8.7
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 05-Jun-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

TEST CERTIFICATE

DETERMINATION OF IN-SITU BULK DENSITY AND IN-SITU MOISTURE DENSITY
BY THE NUCLEAR METHOD
BS 1377-9: Clause 2.5: 1990

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP

DATE	02-Jun-23	**JOB NUMBER**	MRN 4742/16
MATERIAL	Dark Grey Gravel Sand		
NDG MODEL	Troxler 3440	**SERIAL NUMBER**	22848
MODE OF OPERATION	Direct Transmission	**MEASUREMENT APPLICATION**	Compliance tests for compacted material

Test No.	Test Chainage / Location	Test Depth (mm)	Wet Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Percentage Compaction (%)	Air Voids (%)
21	H10 L6	175	1.84	1.59	16	99.1	8.5
22	H10 L7	175	1.88	1.65	14	103.2	8.3
23	H10 L8	175	1.87	1.63	15	101.6	7.8
24	H10 L9	175	1.91	1.65	16	103.3	5.0
25	I10 L5	175	1.92	1.66	16	103.7	5.0
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
				Maximum Dry Density (Mg/m3)	1.60	(Advised by client)	
				Particle Density (Mg/m3)	2.40	(Advised by client)	
				Results corrected for NDG calibration/correlation to site materials	Yes		

REMARKS/ABNORMALITIES

NAME S.J Hutchings (Director) SIGNED DATE 05-Jun-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/16		
TEST LOCATION	Test 01 - H17 L4	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	02-Jun-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Dak Grey Gravel Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4455	4495	4654	4535	0.00	0.00	0.0
4300	4358	4486	4381	-1.53	25.00	88.4
4347	4372	4511	4410	-1.25	0.00	0.0
4318	4346	4482	4382	-1.53	11.00	38.9
4290	4315	4464	4356	-1.78	22.00	77.8
4261	4282	4438	4327	-2.08	29.00	102.6
4232	4250	4411	4298	-2.37	43.00	152.1
4200	4215	4387	4267	-2.67	50.00	176.8
4168	4183	4356	4236	-2.99	59.00	208.7
4221	4239	4409	4290	-2.45	0.00	0.0
4194	4208	4381	4261	-2.74	21.00	74.3
4168	4171	4356	4232	-3.03	38.00	134.4
4138	4140	4331	4203	-3.32	52.00	183.9
4109	4115	4306	4177	-3.58	65.00	229.9
4076	4086	4278	4147	-3.88	77.00	272.3
4048	4057	4253	4119	-4.15	90.00	318.3
4159	4177	4381	4239	-2.96	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	162	kPa
Modulus of subgrade reaction (k) =	130	MPa/m
Equivalent 762 mm plate reaction =	105	MPa/m
Equivalent CBR =	30.5	%
Surface Stiffness Modulus (E) =	157	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	247	kPa
Modulus of subgrade reaction (k) =	197	MPa/m
Equivalent 762 mm plate reaction =	159	MPa/m
Equivalent CBR =	62.9	%
Surface Stiffness Modulus (E) =	249	MN/m^2

Surface Stiffness Modulus Ratio =	1.6

DATE 05-Jun-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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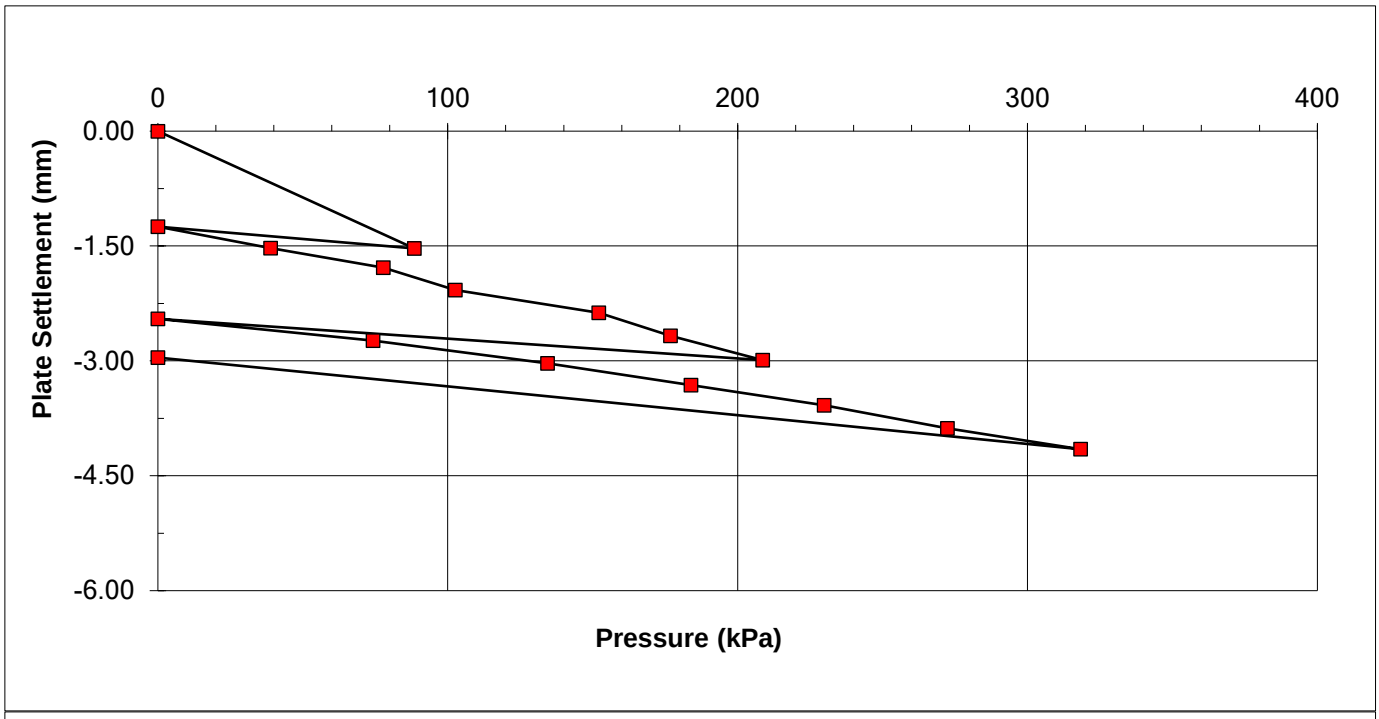
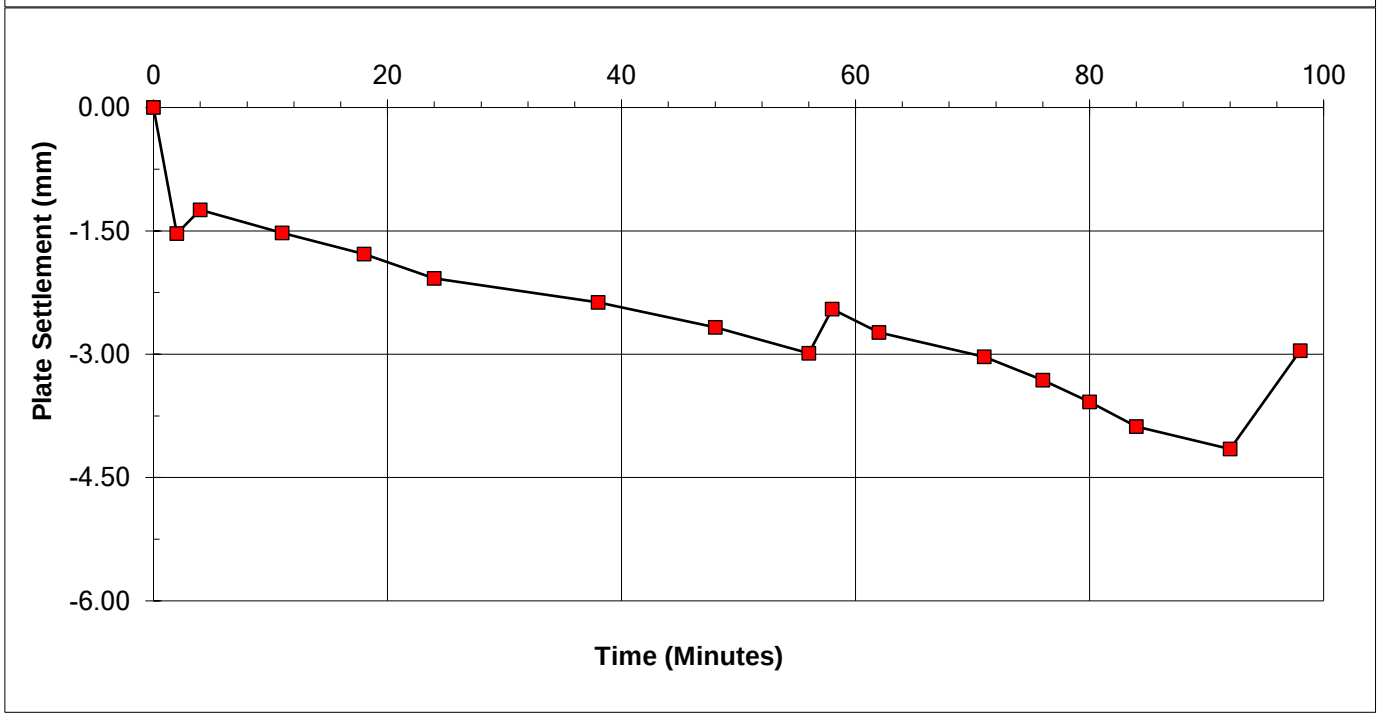
TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 05-Jun-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST
BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)
Estimated Surface Stiffness Modulus CD225 Ver. 1, April 2020

CLIENT	VHE Construction Plc		
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP		
JOB NUMBER	MRN 4742/16		
TEST LOCATION	Test 02 - D20 FGL	LOADING DEVICE	20 Tonne Enerpac Jack
TEST DATE	02-Jun-23	PLATE SIZE (mm)	600 diameter
TEST DEPTH	Surface	REACTION LOAD USED	Site Plant
MATERIAL UNDER TEST	Dak Grey Gravel Sand	MOISTURE CONTENT	Not Required

Dial Gauge 1 (mmx100)	Dial Gauge 2 (mmx100)	Dial Gauge 3 (mmx100)	Mean Gauge (mmx100)	Mean Deflection (mm)	Load (kN)	Pressure (kPa)
4758	4699	4675	4711	0.00	0.00	0.0
4603	4533	4515	4550	-1.60	22.00	77.8
4653	4572	4547	4591	-1.20	0.00	0.0
4622	4545	4522	4563	-1.48	12.00	42.4
4592	4516	4490	4533	-1.78	24.00	84.9
4560	4491	4457	4503	-2.08	35.00	123.8
4530	4463	4428	4474	-2.37	46.00	162.7
4500	4432	4397	4443	-2.68	64.00	226.4
4471	4402	4366	4413	-2.98	73.00	258.2
4515	4487	4506	4503	-2.08	0.00	0.0
4487	4465	4476	4476	-2.35	16.00	56.6
4455	4438	4451	4448	-2.63	29.00	102.6
4422	4406	4426	4418	-2.93	38.00	134.4
4387	4377	4401	4388	-3.22	51.00	180.4
4347	4341	4376	4355	-3.56	68.00	240.5
4315	4311	4341	4322	-3.88	82.00	290.0
4409	4445	4428	4427	-2.83	0.00	0.0

1st Load Cycle

Pressure at 1.25 mm deflexion =	179	kPa
Modulus of subgrade reaction (k) =	143	MPa/m
Equivalent 762 mm plate reaction =	115	MPa/m
Equivalent CBR =	36.1	%
Surface Stiffness Modulus (E) =	175	MN/m^2

2nd Load Cycle

Pressure at 1.25 mm deflexion =	199	kPa
Modulus of subgrade reaction (k) =	160	MPa/m
Equivalent 762 mm plate reaction =	128	MPa/m
Equivalent CBR =	43.5	%
Surface Stiffness Modulus (E) =	197	MN/m^2

Surface Stiffness Modulus Ratio =	1.1

DATE 05-Jun-23

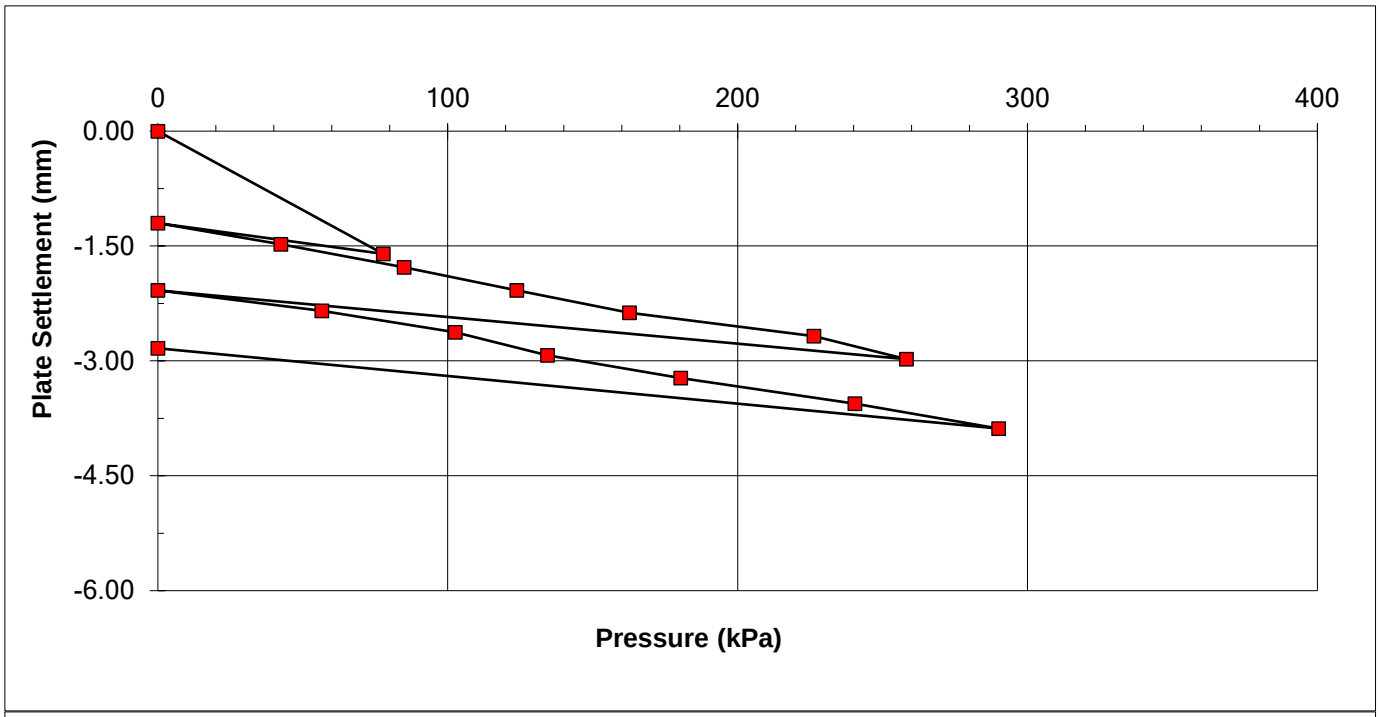
MURRAY RIX

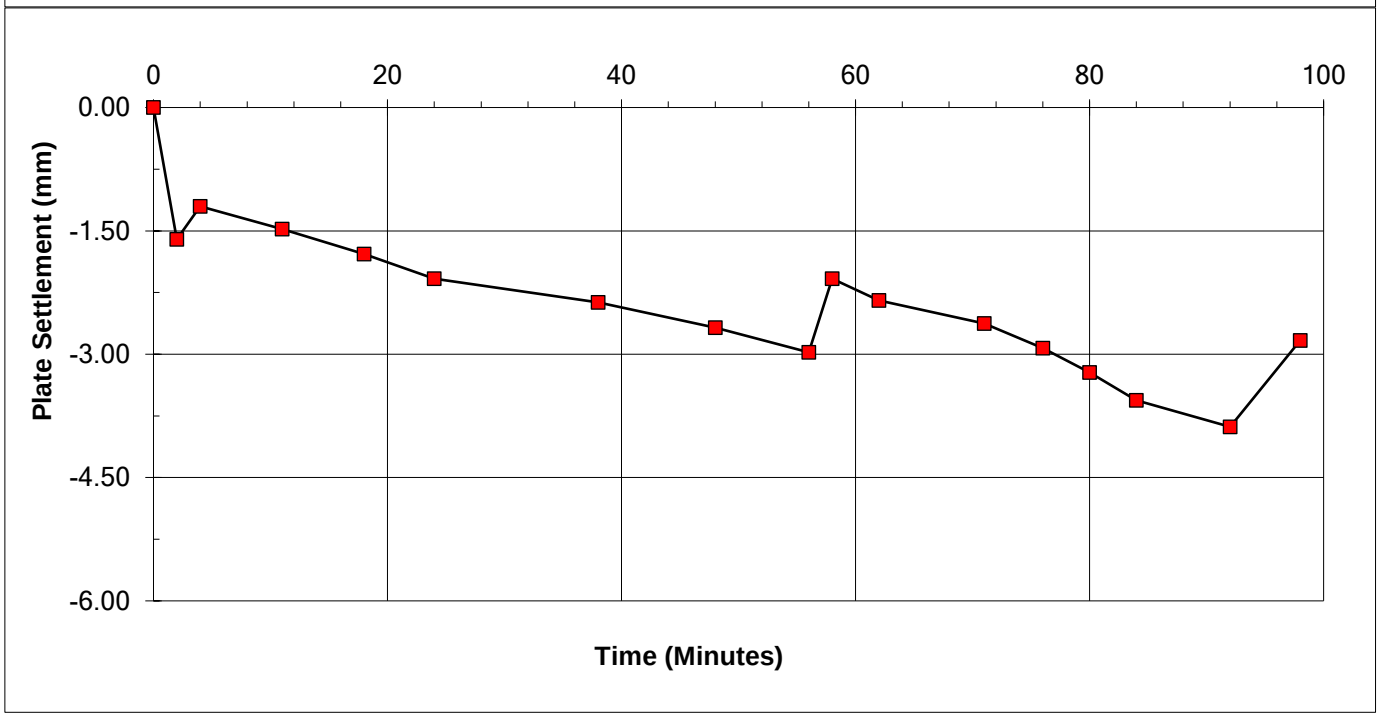
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PLATE INCREMENTAL LOAD TEST

BS 1377 : PART 9 : CL 4.1 and IAN 73/06 Rev 1 (2009)





REMARKS
Recommended CBR range for Surface Stiffness Modulus calculation is 2-12%.

SIGNED

NAME S.J Hutchings (Director) DATE 05-Jun-23

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,

DUKINFIELD, CHESHIRE SK16 4QX

TEL 0161 475 0870

TEST CERTIFICATE

INSITU DENSITY, SAND REPLACEMENT METHOD

BS 1377 : Part 9 : Clause 2.2

MOISTURE CONTENT METHOD BS 1377 : Part 2 CLAUSE 3.2 : 1990 (OVEN DRY)

CLIENT	VHE Construction Plc
SITE	808 - Former Tarmac Manufacturing Plant, Stopes Road, Bolton BL3 1NP
JOB NUMBER	MRN 4742/16

TEST METHOD	Large Pouring Cylinder	DATE RECEIVED	31-May-23
DATE OF TEST	31-May-23	SAMPLED BY	Murray Rix
DATE TESTED	01-Jun-23	MATERIAL SOURCE	Site Won

Laboratory Sample Number	Test Location	Material	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Moisture Content (%)	Compaction (%)	Air Voids (%)
126149	SRD H17 L6	Ash	1.82	1.56	17	97.5	8.5
126150	SRD G19 L5	Ash	1.84	1.60	15	100.3	9.3
126151	SRD H20 L5	Ash	1.90	1.64	16	102.5	5.4
		Maximum Dry Density (Mg/m^3)		1.60		(Advised by client)	
		Particle Density (Mg/m^3)		2.40		(Advised by client)	

COMMENT / ANOMALIES

NAME S.J Hutchings (Director) SIGNED DATE 05-Jun-23

LABORATORY REPORT

Contract Number: PSL23/3127

Report Date: 10 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road, Bolton

Date Received: 28/4/2023
Date Commenced: 28/4/2023
Date Completed: 10/5/2023

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 (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Grid Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Air Voids %	Percent of Compaction %	Remarks
Core 1	L1	G9		03/05/2023	13	2.21	1.96	2.7	99	Brown gravelly sandy CLAY.
Core 2	L1	G8		03/05/2023	14	2.18	1.91	2.9	97	Brown gravelly sandy CLAY.
Core 3	L1	G7		03/05/2023	13	2.19	1.94	3.6	98	Brown gravelly sandy CLAY.
SRD 1	L1	G9		03/05/2023	14	2.20	1.93	2.0	97	Brown gravelly sandy CLAY.

Average Particle Density (Mg/m3): **2.72**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road, Bolton

Contract No:

PSL23/3127

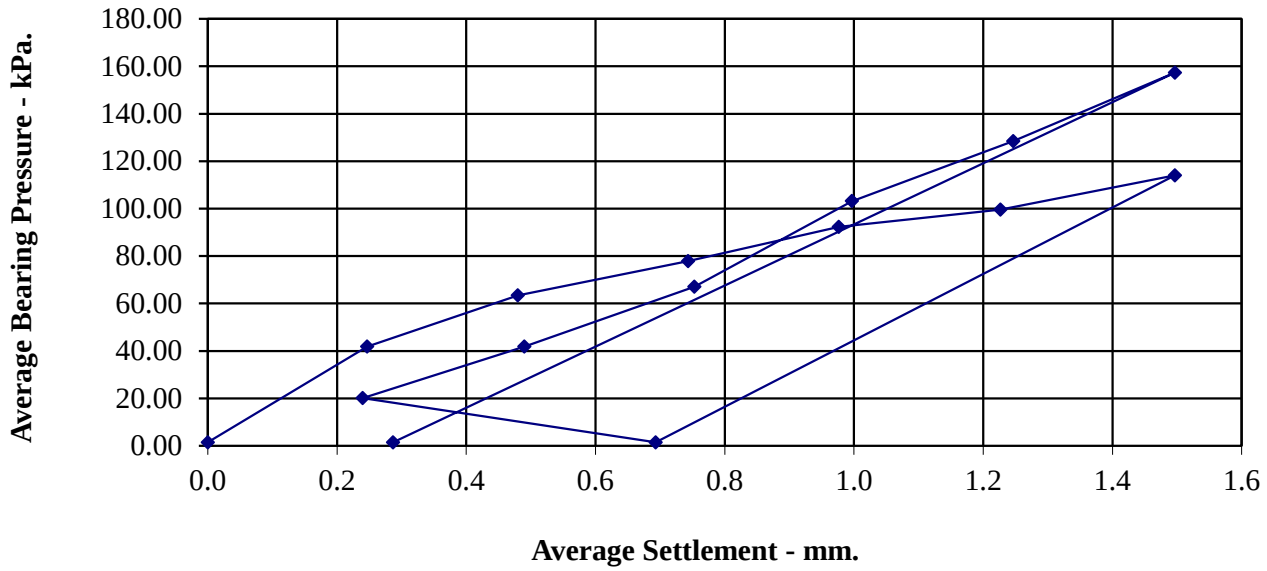
Client Ref:

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**03-May-23**	**Test Ref:**	
Grid Ref:	**D7**	**Depth (m):**	
Layer:	**L7**	**Comments:**	

Maximum Applied Pressure (kPa): **157.33**
Maximum Deformation (mm): **1.50**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



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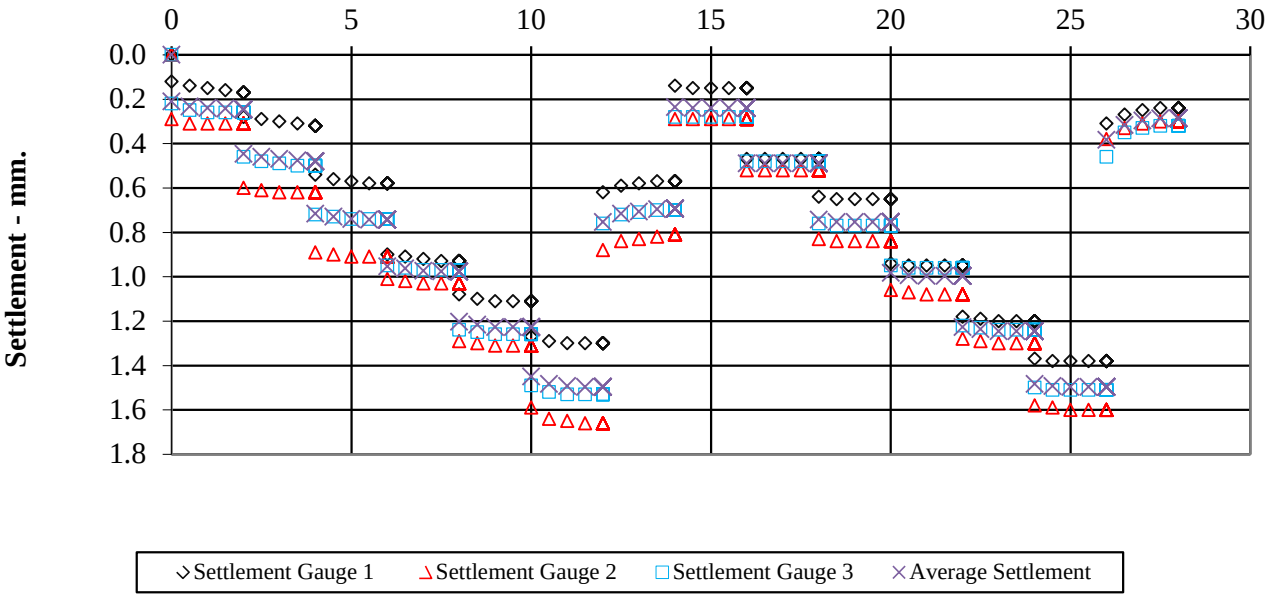


UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3127 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

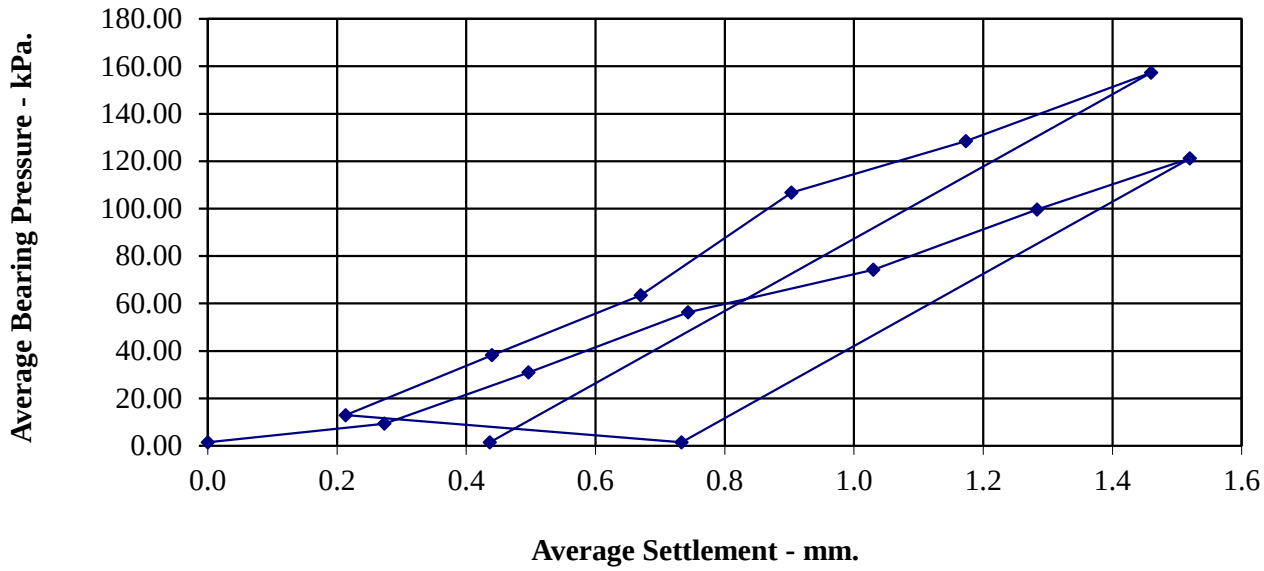
Date of Test	**3-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**D7**	
Layer	**L7**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.50**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**100**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**65.5**	**$kN/m^2/mm$**
CBR Value	**13.5**	**%**

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**03-May-23**	**Test Ref:**	
Grid Ref:	**G18**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **157.33**
Maximum Deformation (mm): **1.52**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



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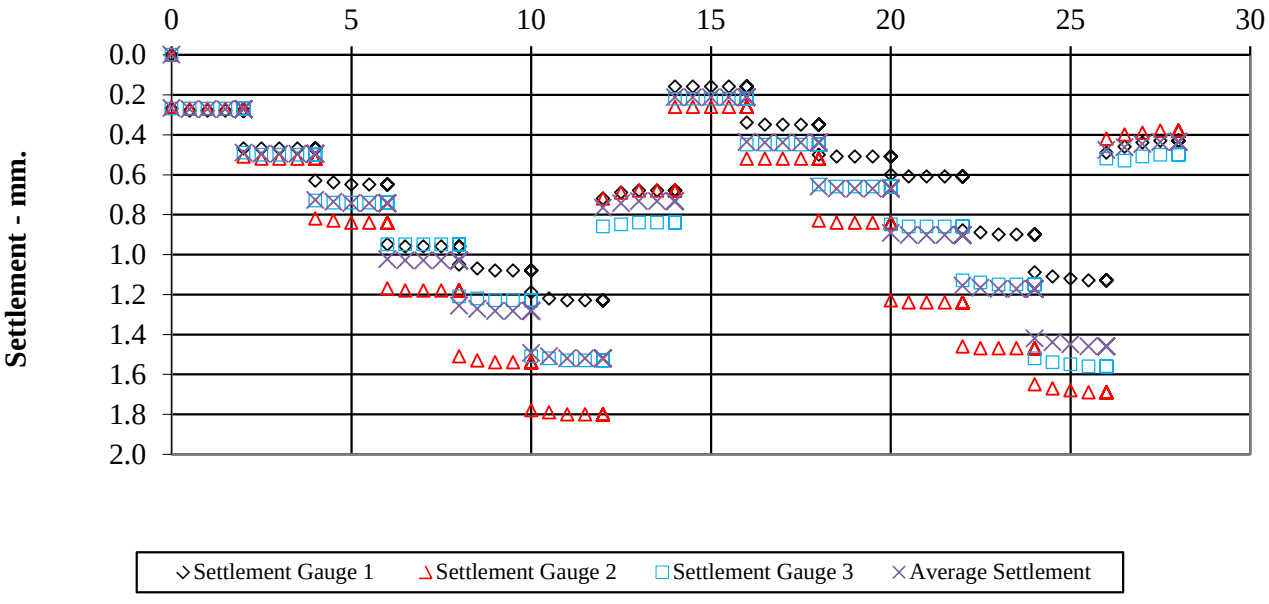


UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3127 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

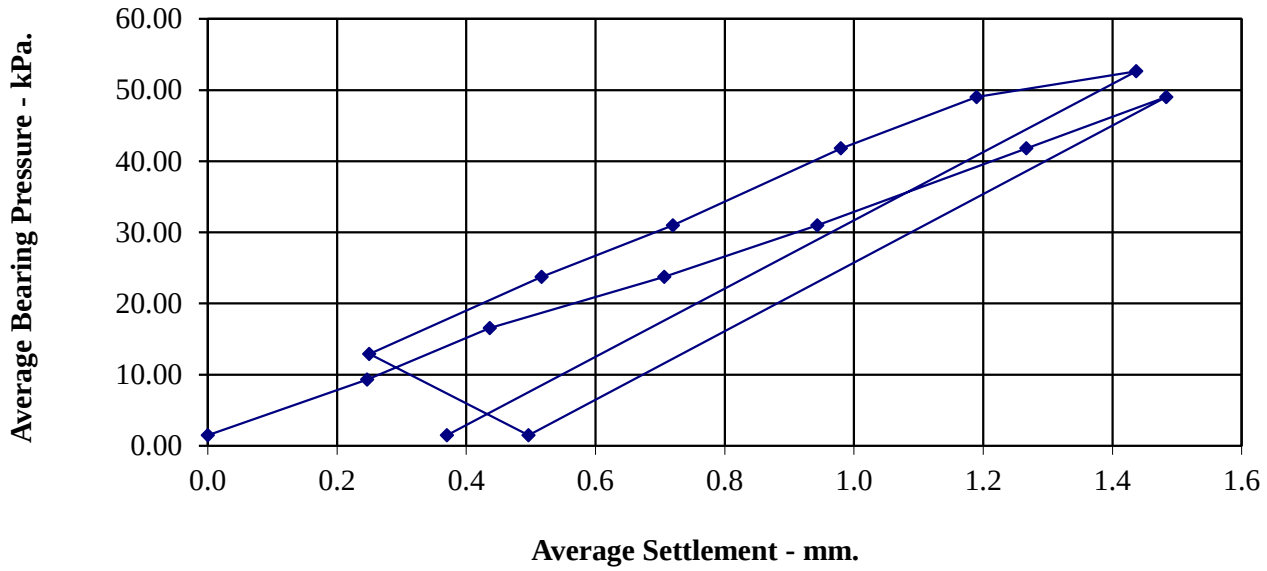
Date of Test	**3-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**G18**	
Layer	**L4**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.52**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**96**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**62.9**	**$kN/m^2/mm$**
CBR Value	**12.6**	**%**

VERTICAL DEFORMATION TESTS.

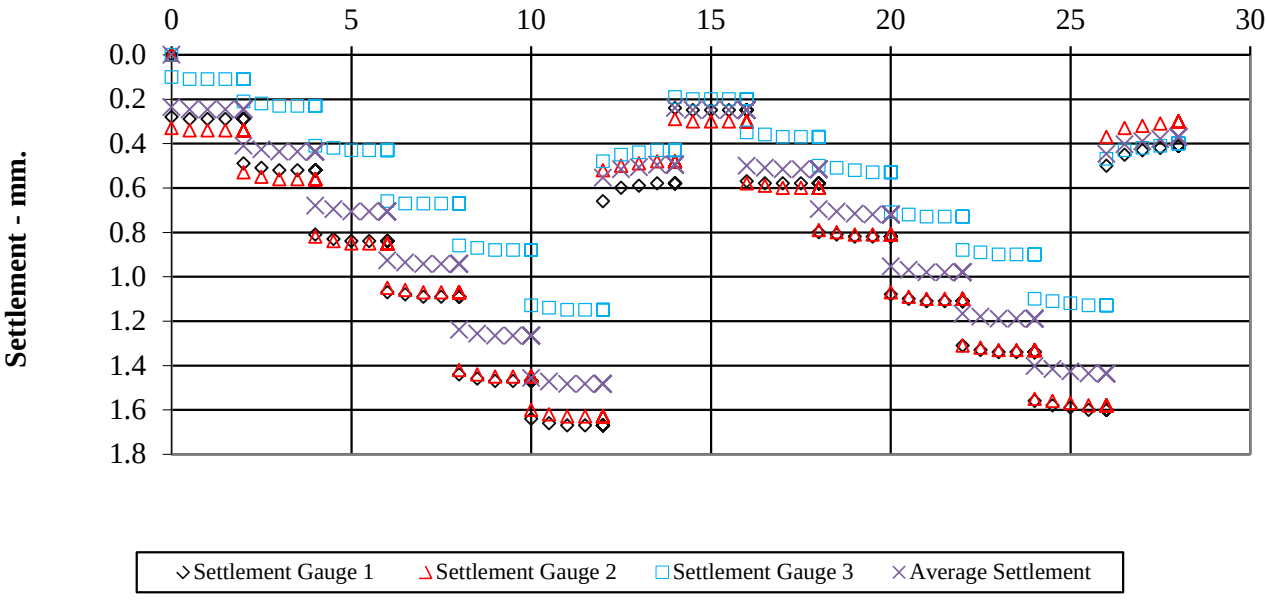
BS 1377 : Part 9 : 1990.

Date of Test:	**03-May-23**	**Test Ref:**	
Grid Ref:	**I8**	**Depth (m):**	
Layer:	**L8**	**Comments:**	

Maximum Applied Pressure (kPa): **52.64**
Maximum Deformation (mm): **1.48**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3127
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

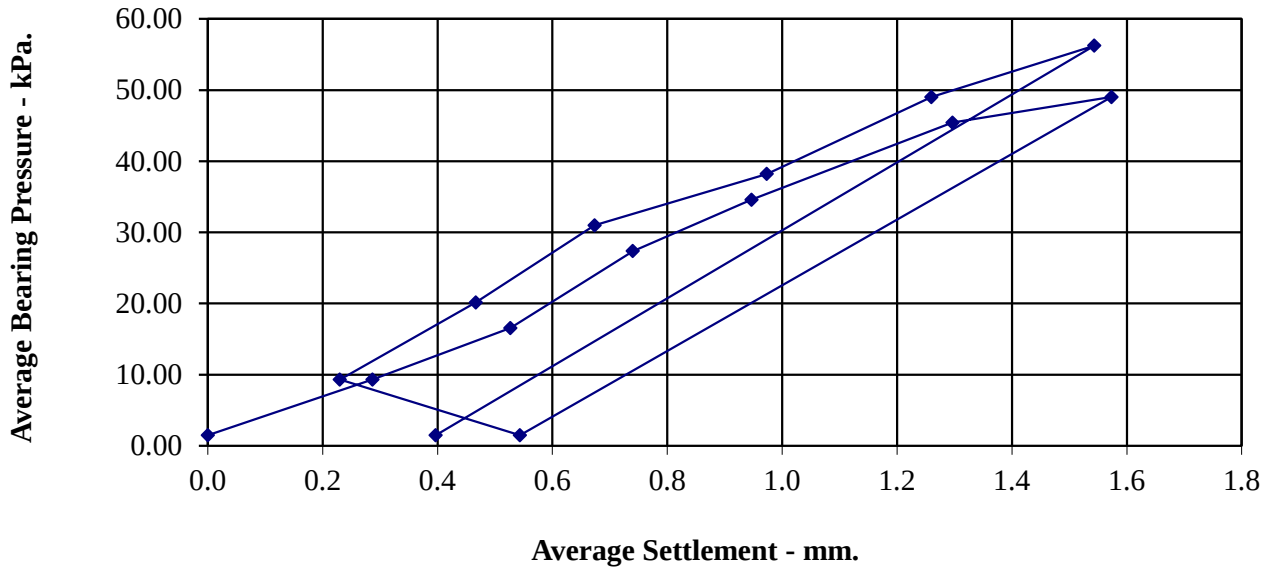
Date of Test	**3-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I8**	
Layer	**L8**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.48**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**41**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**26.9**	**$kN/m^2/mm$**
CBR Value	**2.9**	**%**

VERTICAL DEFORMATION TESTS.

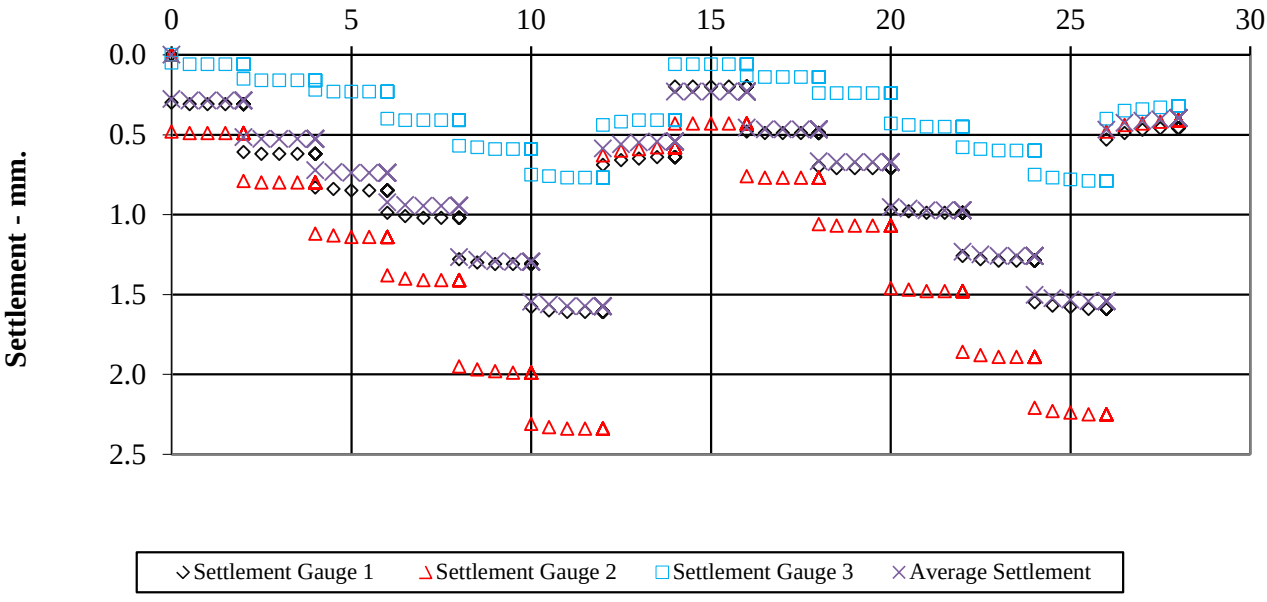
BS 1377 : Part 9 : 1990.

Date of Test:	**03-May-23**	**Test Ref:**	
Grid Ref:	**I9**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **56.25**
Maximum Deformation (mm): **1.57**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3127
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

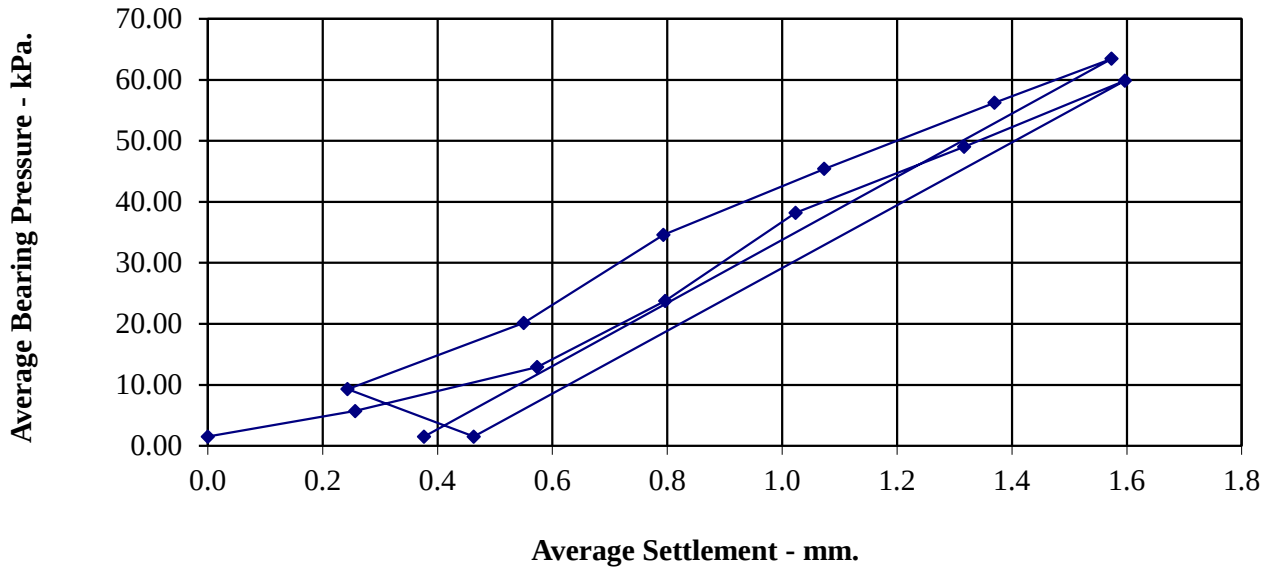
Date of Test	**3-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I9**	
Layer	**L4**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.57**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**44**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**28.7**	**kN/m^2/mm**
CBR Value	**3.2**	**%**

VERTICAL DEFORMATION TESTS.

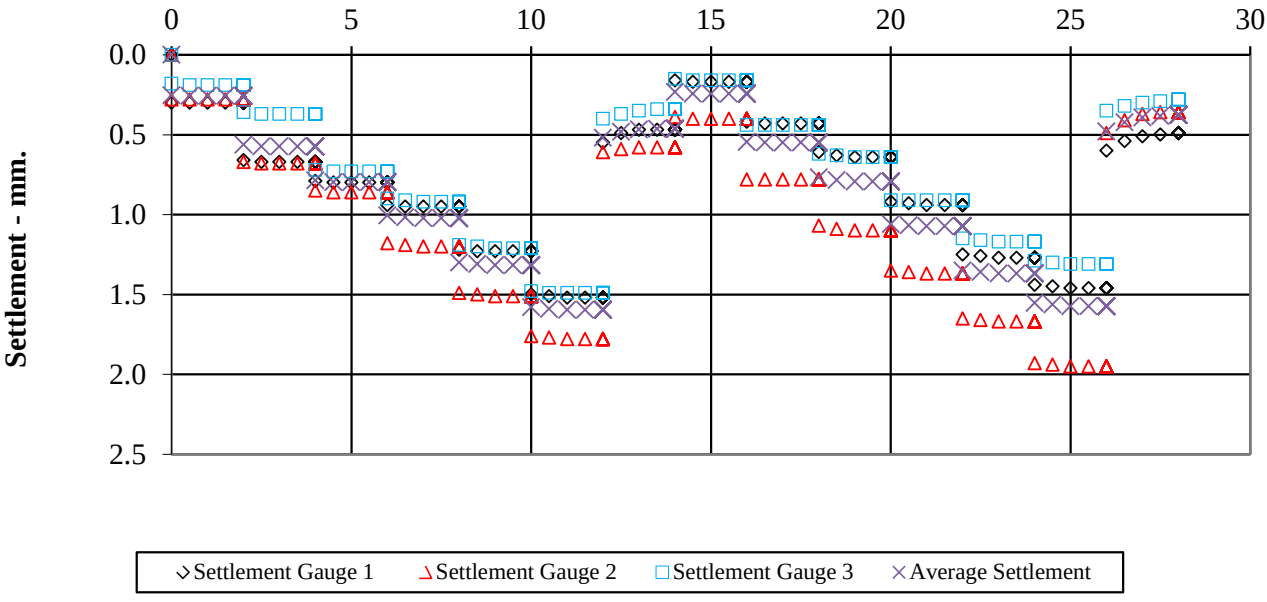
BS 1377 : Part 9 : 1990.

Date of Test:	**03-May-23**	**Test Ref:**	
Grid Ref:	**H11**	**Depth (m):**	
Layer:	**L8**	**Comments:**	

Maximum Applied Pressure (kPa): **63.47**
Maximum Deformation (mm): **1.60**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3127
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**3-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**H11**	
Layer	**L8**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.60**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**47**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**30.4**	**kN/m^2/mm**
CBR Value	**3.6**	**%**

LABORATORY REPORT

Contract Number: PSL23/3127

Report Date: 11 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road, Bolton

Date Received: 28/4/2023
Date Commenced: 28/4/2023
Date Completed: 10/5/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Grid Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Air Voids %	Percent of Compaction %	Remarks
Core 1	L7	H9		28/04/2023	13	2.20	1.95	3.1	98	Brown gravelly sandy CLAY.
Core 2	L8	H9		28/04/2023	12	2.21	1.97	3.8	100	Brown gravelly sandy CLAY.
SRD 1	L8	H9		28/04/2023	12	2.20	1.96	4.2	99	Brown gravelly sandy CLAY.

Average Particle Density (Mg/m3): **2.72**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road, Bolton

Contract No:

PSL23/3127

Client Ref:

SUMMARY OF INSITU TESTS

BS1377 : PART : 9 : 1990

Position Number	Layer Number	Grid Number	Depth (m)	Date Tested	Moisture Content %	Bulk Density Mg/m^3 Clause 2.2	Dry Density Mg/m^3 Clause 2.2	Air Voids %	Percent of Compaction %	Remarks
Core 1	L4	E18		28/04/2023	22	1.87	1.53	2.4	96	Dark grey gravelly SAND.
Core 2	L4	E19		28/04/2023	21	1.87	1.55	3.2	97	Dark grey gravelly SAND.
Core 3	L4	E20		28/04/2023	19	1.90	1.60	3.1	100	Dark grey gravelly SAND.
SRD 1	L3	C20		28/04/2023	19	1.90	1.60	3.1	100	Dark grey gravelly SAND.
SRD 2	L4	E19		28/04/2023	21	1.88	1.55	2.6	97	Dark grey gravelly SAND.
SRD 3	L4	F18		28/04/2023	19	1.89	1.59	3.6	99	Dark grey gravelly SAND.

Average Particle Density (Mg/m3): **2.40**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road, Bolton

Contract No:

PSL23/3127

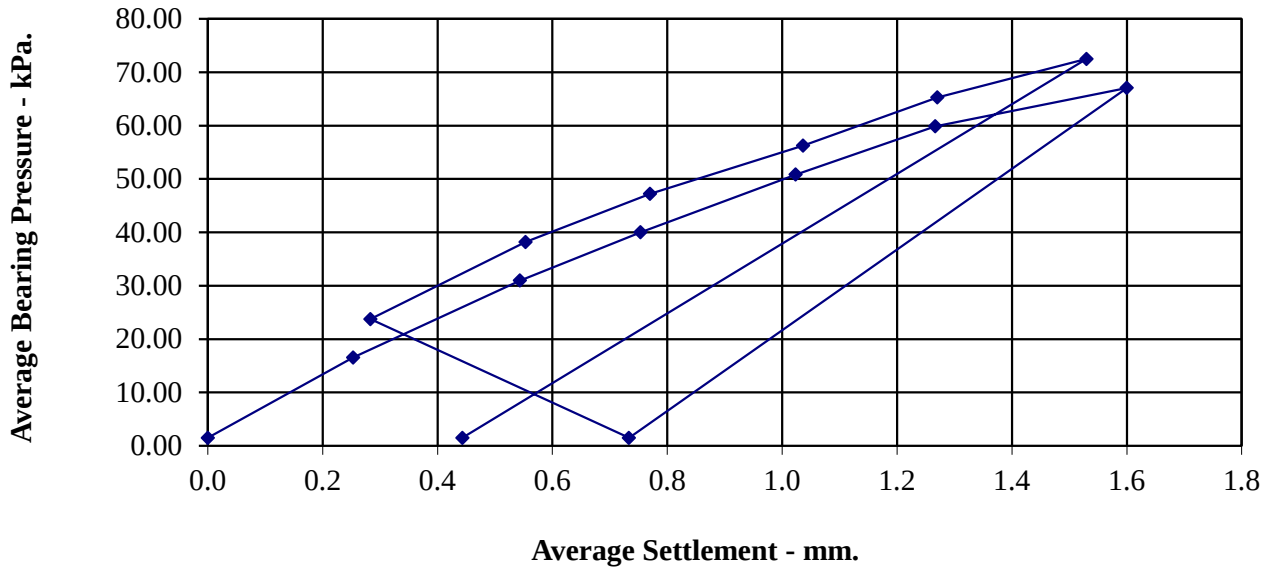
Client Ref:

VERTICAL DEFORMATION TESTS.

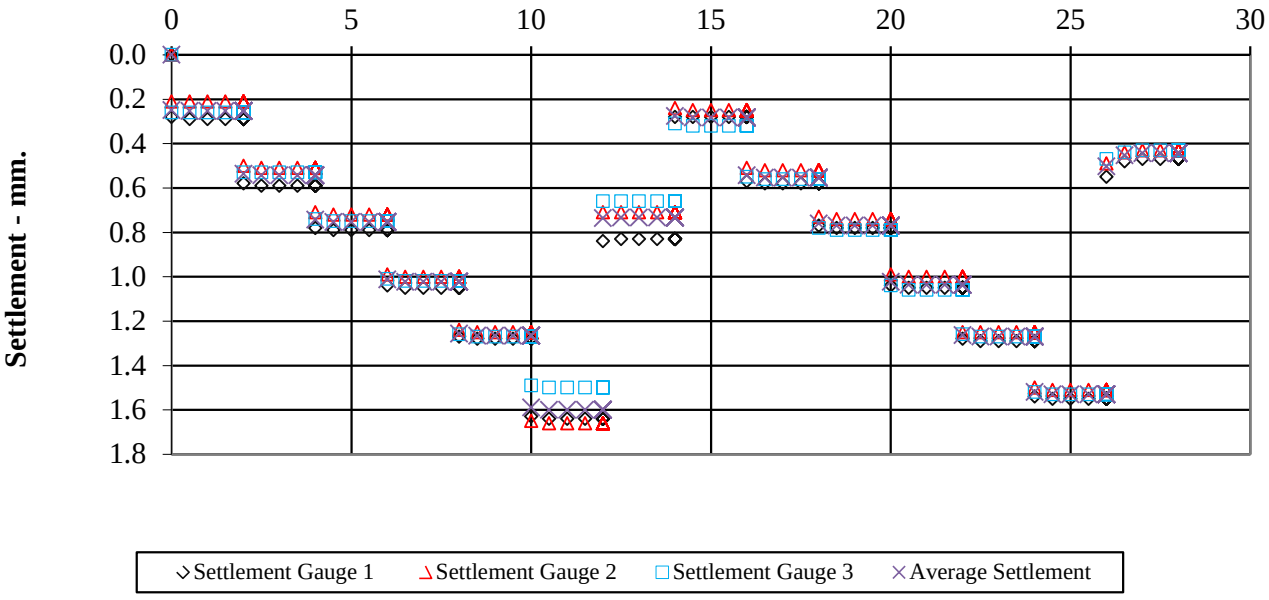
BS 1377 : Part 9 : 1990.

Date of Test:	**28-Apr-23**	**Test Ref:**	
Grid Ref:	**E18**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **72.49**
Maximum Deformation (mm): **1.60**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3127 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

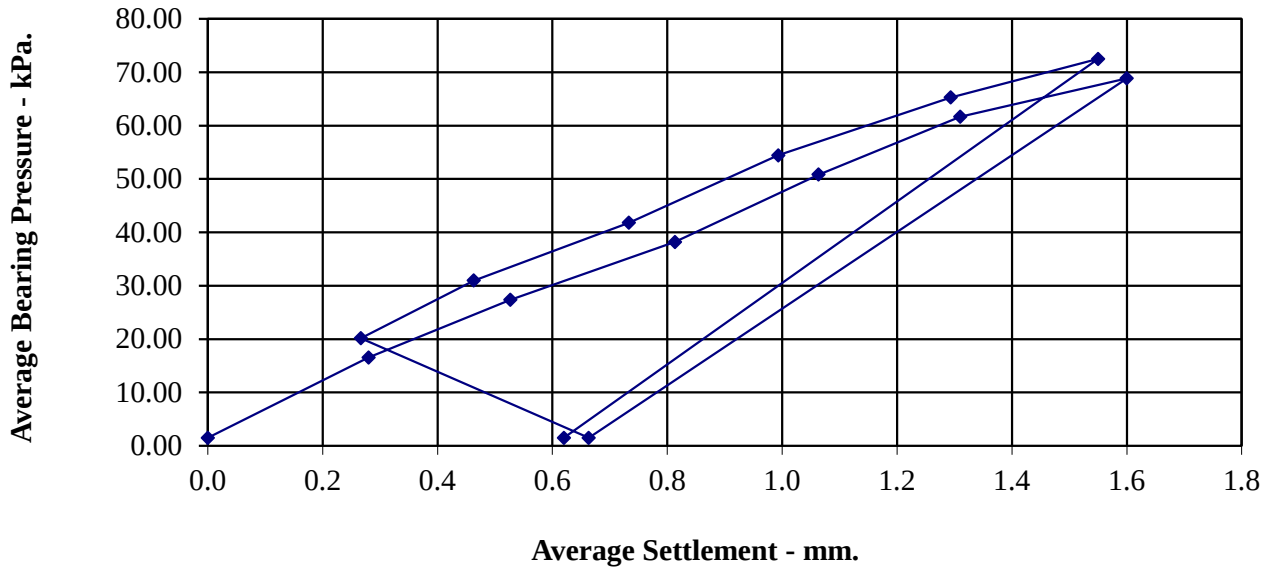
Date of Test	**28-Apr-23**	
Test Ref		
Depth (m)		
Grid Ref	**E18**	
Layer	**L4**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.60**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**59**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**38.7**	**kN/m^2/mm**
CBR Value	**5.4**	**%**

VERTICAL DEFORMATION TESTS.

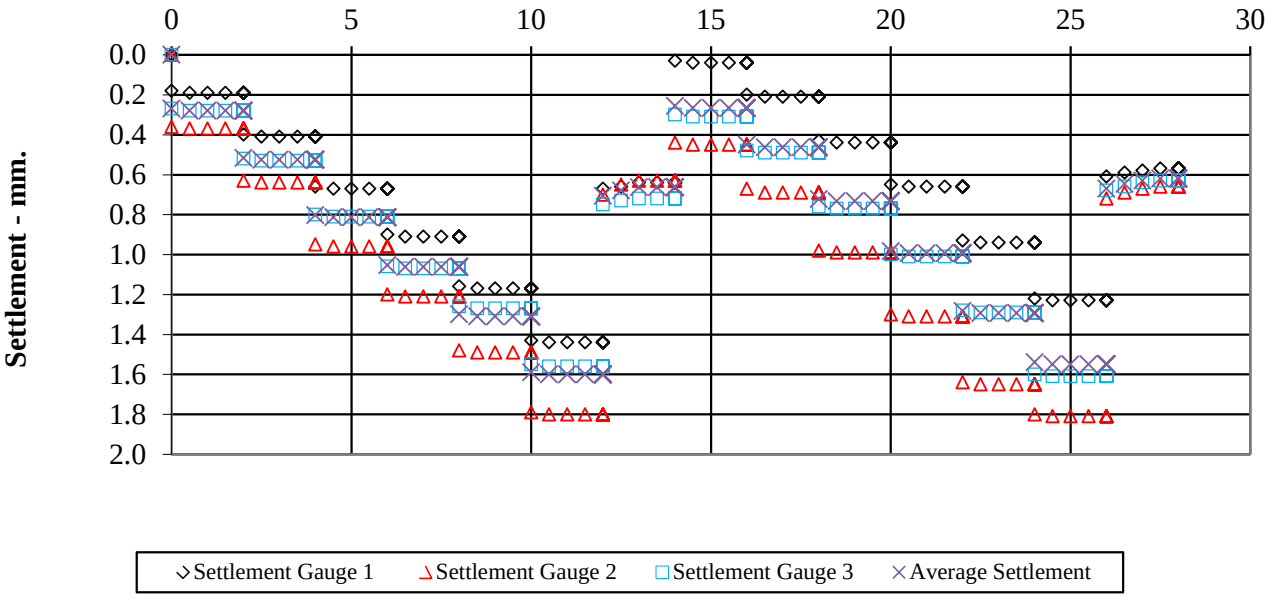
BS 1377 : Part 9 : 1990.

Date of Test:	**28-Apr-23**	**Test Ref:**	
Grid Ref:	**F9**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **72.49**
Maximum Deformation (mm): **1.60**
Plate Area (m2): **0.2922**
Description: **Yellow POS CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3127 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

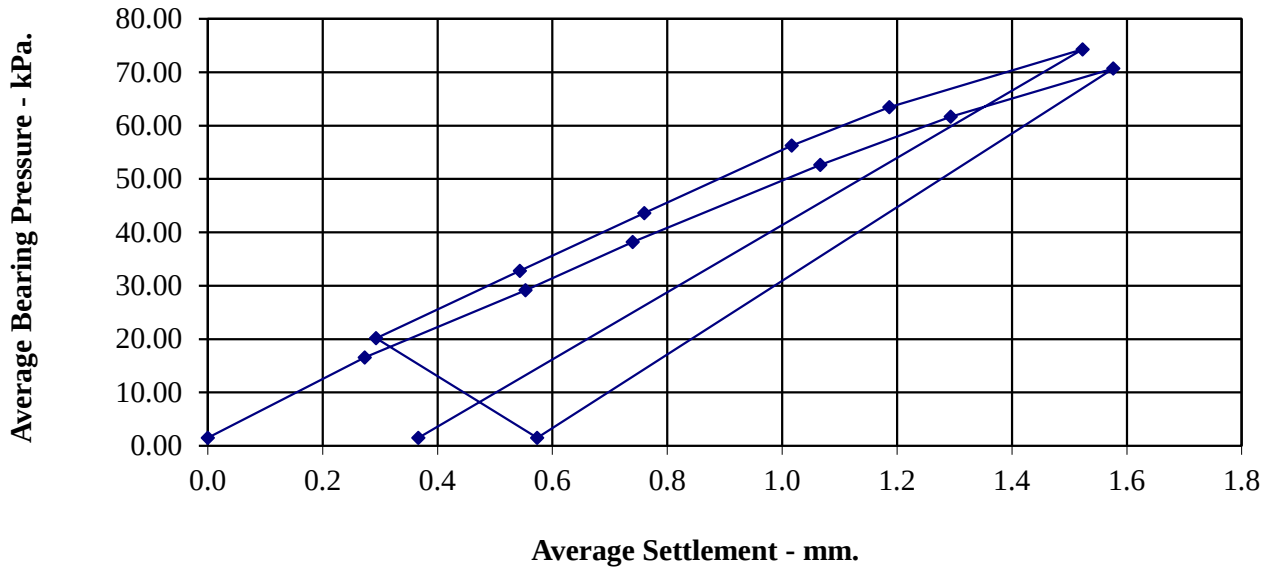
Date of Test	**28-Apr-23**	
Test Ref		
Depth (m)		
Grid Ref	**F9**	
Layer	**L4**	
Comments		
Description	**Yellow POS CLAY.**	
Maximum Deflection	**1.60**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**59**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**38.6**	**$kN/m^2/mm$**
CBR Value	**5.4**	**%**

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**28-Apr-23**	**Test Ref:**	
Grid Ref:	**F20**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **74.30**
Maximum Deformation (mm): **1.58**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



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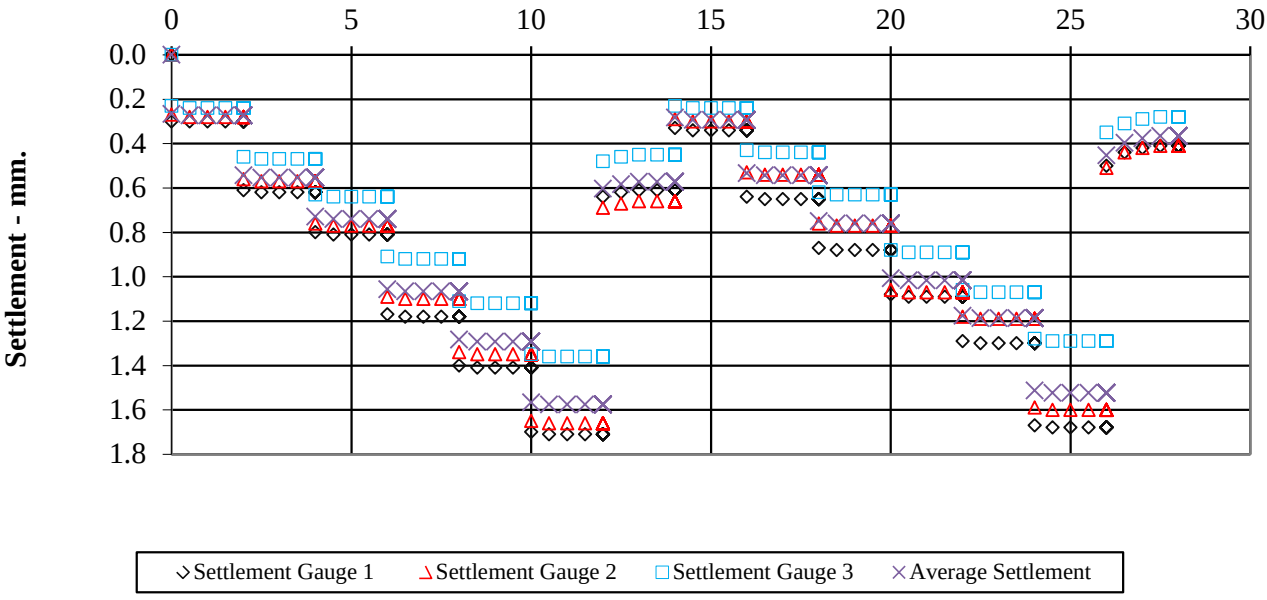

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3127
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**28-Apr-23**	
Test Ref		
Depth (m)		
Grid Ref	**F20**	
Layer	**L4**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.58**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**60**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**39.2**	**$kN/m^2/mm$**
CBR Value	**5.6**	**%**

LABORATORY REPORT

Contract Number: PSL23/3339

Report Date: 10 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road,Bolton

Date Received: 5/5/2023
Date Commenced: 5/5/2023
Date Completed: 10/5/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Sample Number	Layer Number	Grid Ref	Sample Type	Sample Date	Description of Sample
	L4	E20			Dark grey gravelly SAND.
	L8	H9			Brown gravelly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road, Bolton

Contract No:

PSL23/3339

Client Ref:

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Sample Number	Layer Number	Grid Ref	Sample Type	Sample Date	Moisture Content % Clause 3.2	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
	L4	E20				2.40					
	L8	H9				2.72					

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHOENIX GROUP COMPANY

Stopes Road, Bolton

Contract No:

PSL23/3339

Client Ref:

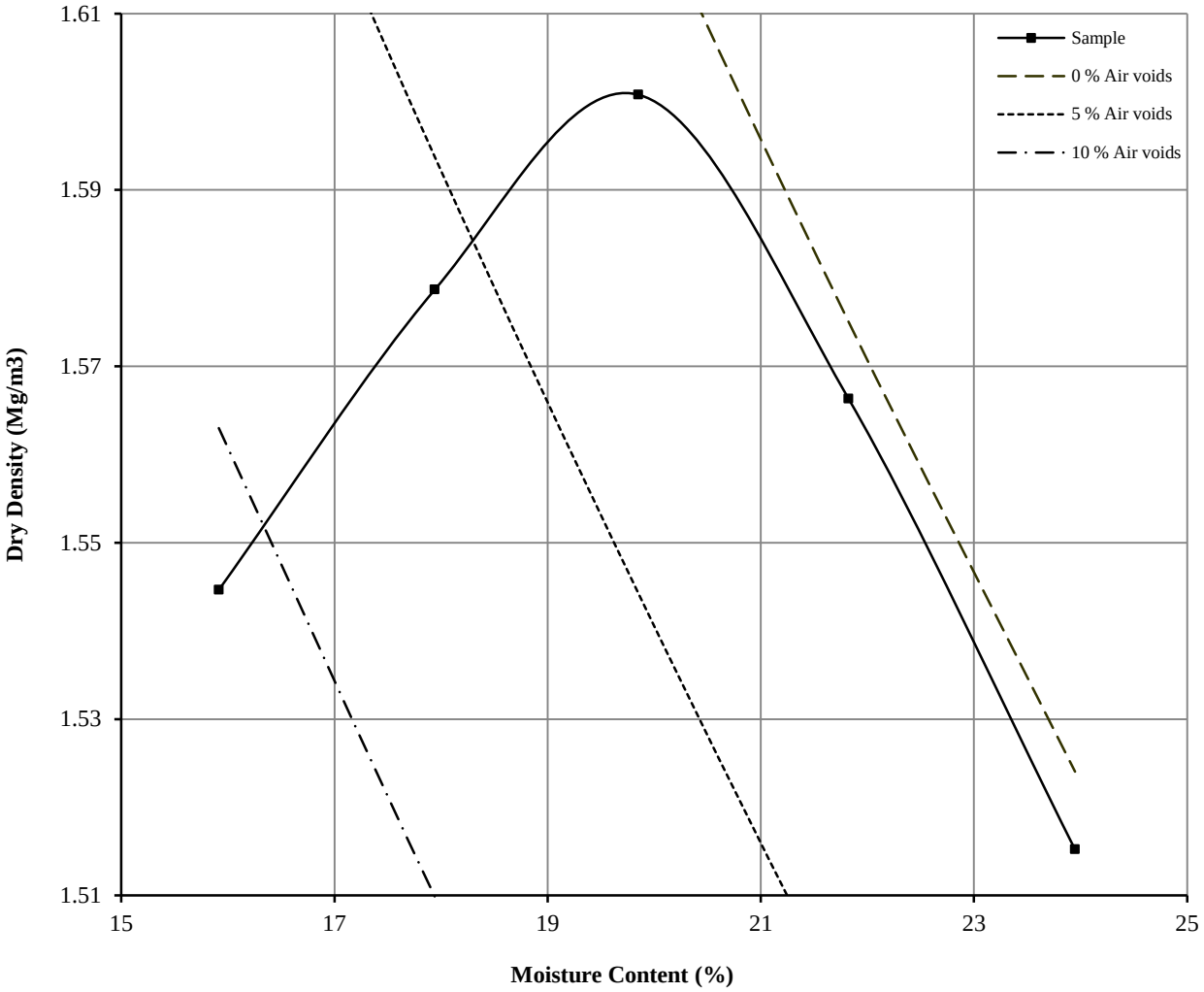
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

Sample Number: **Grid Ref:** **E20**

Layer Number: **L4** **Sample Date:**

Sample Type:



Initial Moisture Content:		22	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.4	Measured	Material Retained on 37.5 mm Test Sieve (%):		3
Maximum Dry Density (Mg/m3):		1.60	Material Retained on 20.0 mm Test Sieve (%):		12
Optimum Moisture Content (%):		20			
Remarks See summary of soil descriptions.					

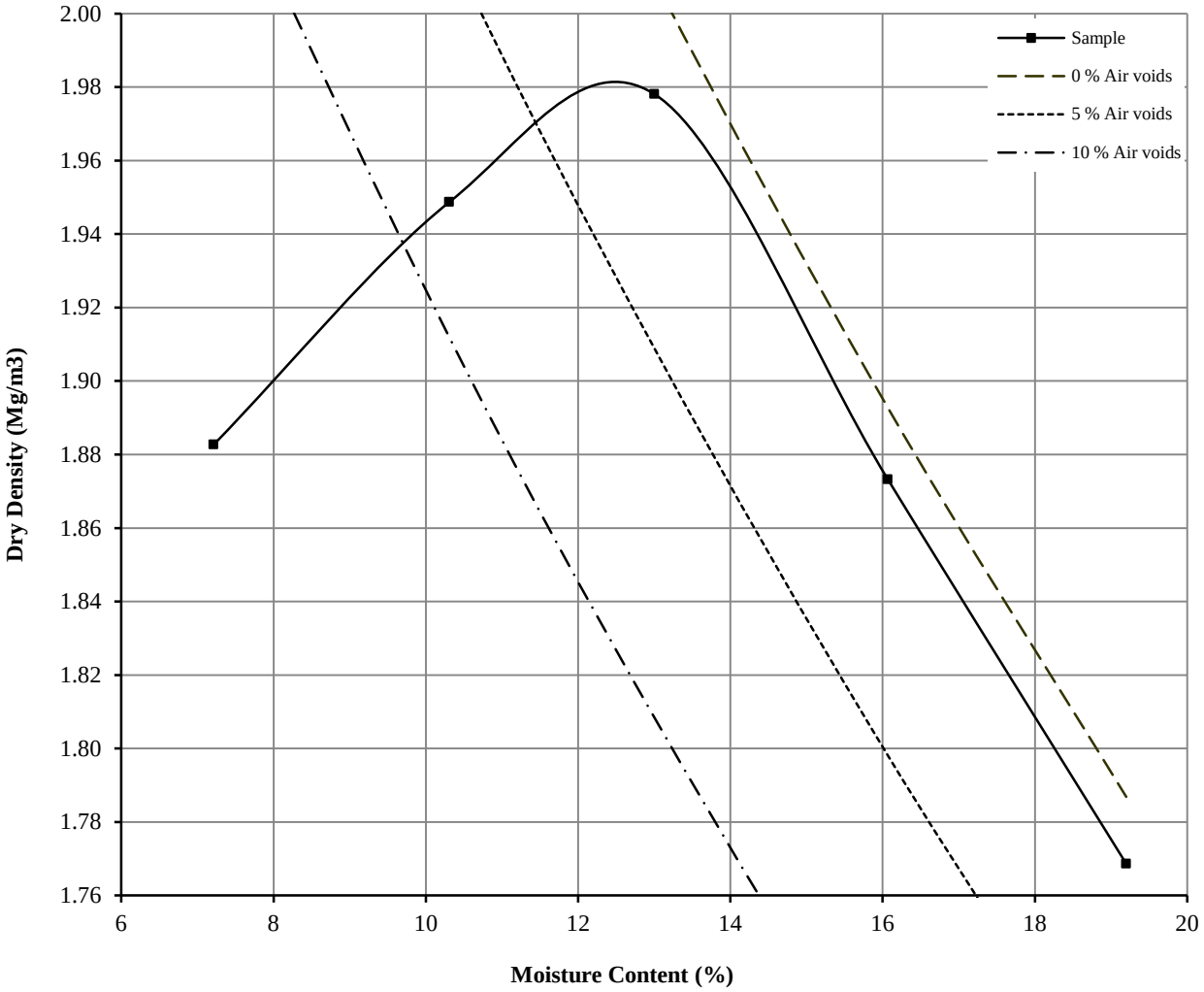
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.5 : 1990

Sample Number: **Grid Ref:** **H9**

Layer Number: **L8** **Sample Date:**

Sample Type:



Initial Moisture Content:		13	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.72	Measured	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.98	Material Retained on 20.0 mm Test Sieve (%):		2
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions.					

UKAS TESTING 4043 PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No.** **PSL23/3339** **Client Ref**

LABORATORY REPORT

Contract Number: PSL23/3603

Report Date: 22 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road, Bolton

Date Received: 15/5/2023
Date Commenced: 15/5/2023
Date Completed: 16/5/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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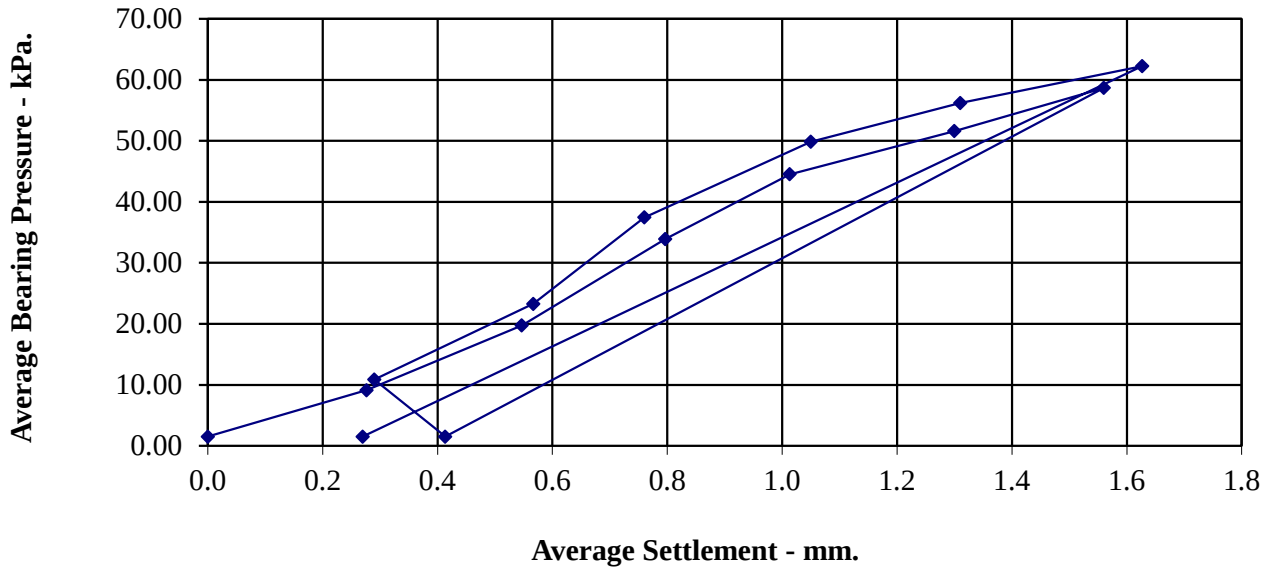
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

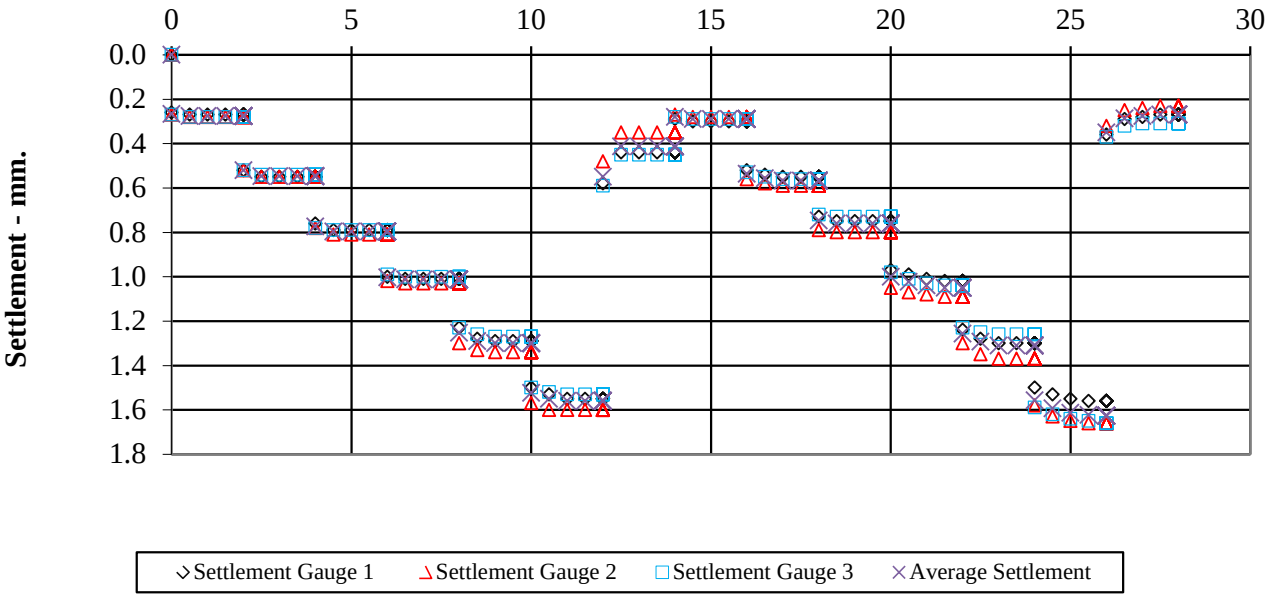
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**B12**	**Depth (m):**	
Layer:	**L12**	**Comments:**	

Maximum Applied Pressure (kPa): **62.24**
Maximum Deformation (mm): **1.56**
Plate Area (m2): **0.2922**
Description: **Brown gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

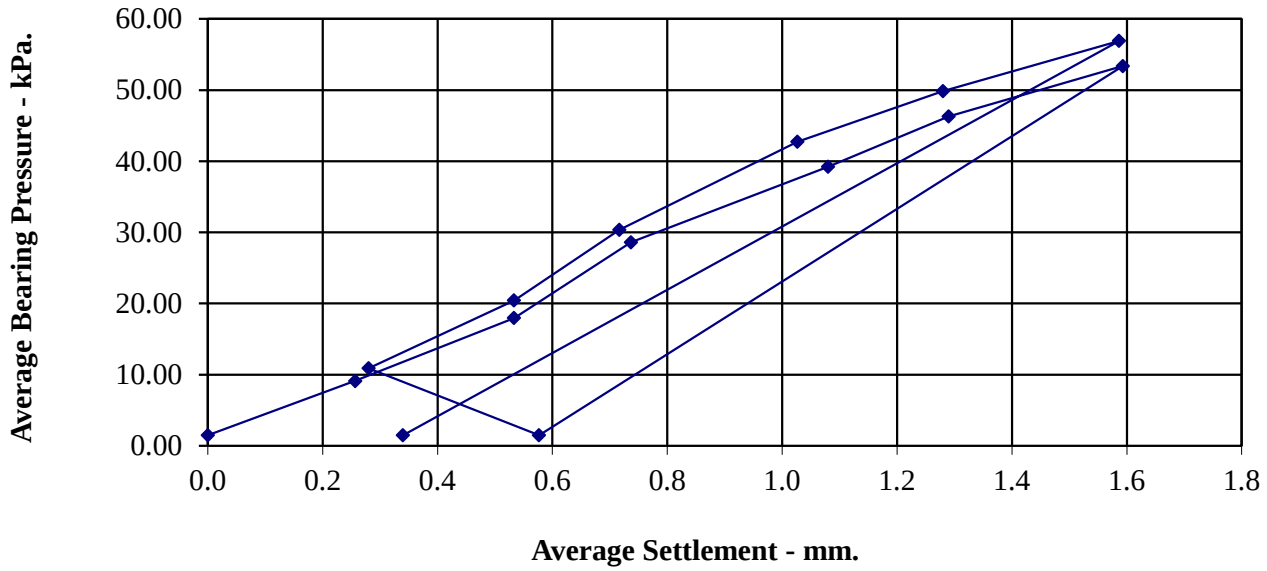
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B12**	
Layer	**L12**	
Comments		
Description	**Brown gravelly SAND.**	
Maximum Deflection	**1.56**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**50**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**32.9**	**$kN/m^2/mm$**
CBR Value	**4.1**	**%**

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**B14**	**Depth (m):**	
Layer:	**L8**	**Comments:**	

Maximum Applied Pressure (kPa): **56.93**
Maximum Deformation (mm): **1.59**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



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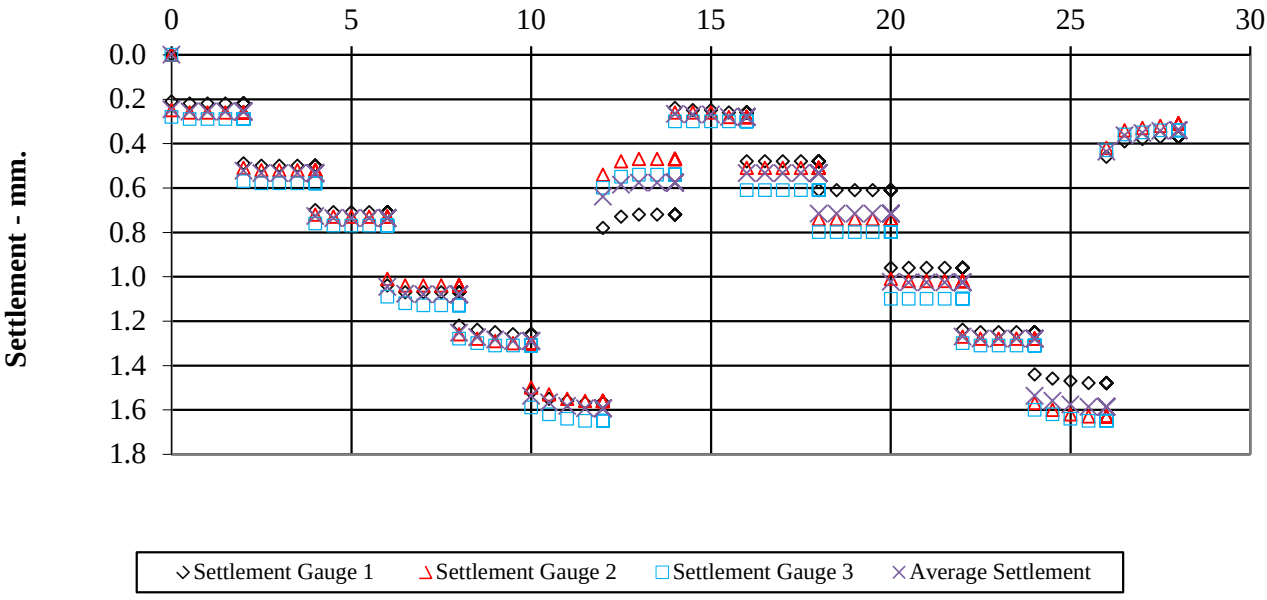


UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

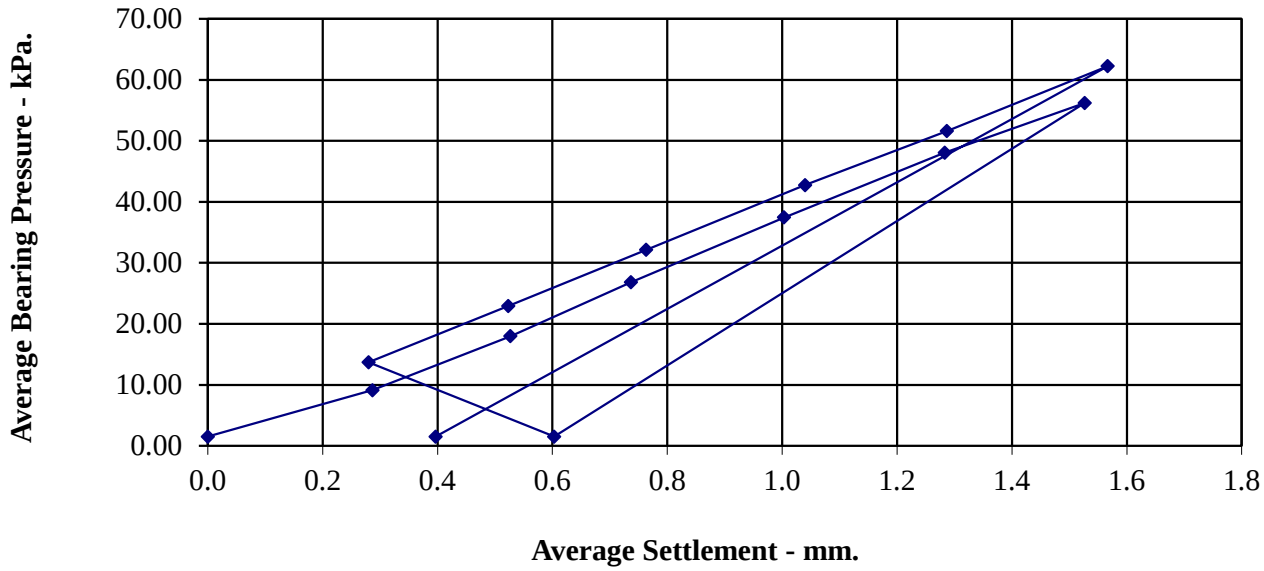
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B14**	
Layer	**L8**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.59**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**45**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**29.4**	**$kN/m^2/mm$**
CBR Value	**3.4**	**%**

VERTICAL DEFORMATION TESTS.

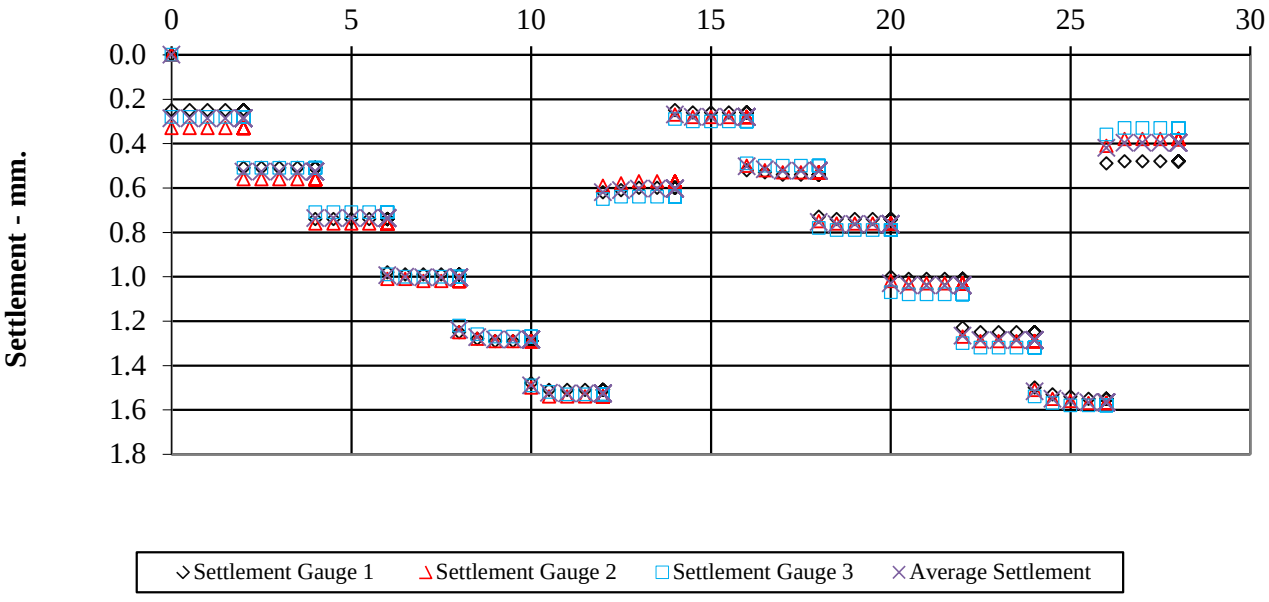
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**B15**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **62.24**
Maximum Deformation (mm): **1.53**
Plate Area (m2): **0.2922**
Description: **Brown gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

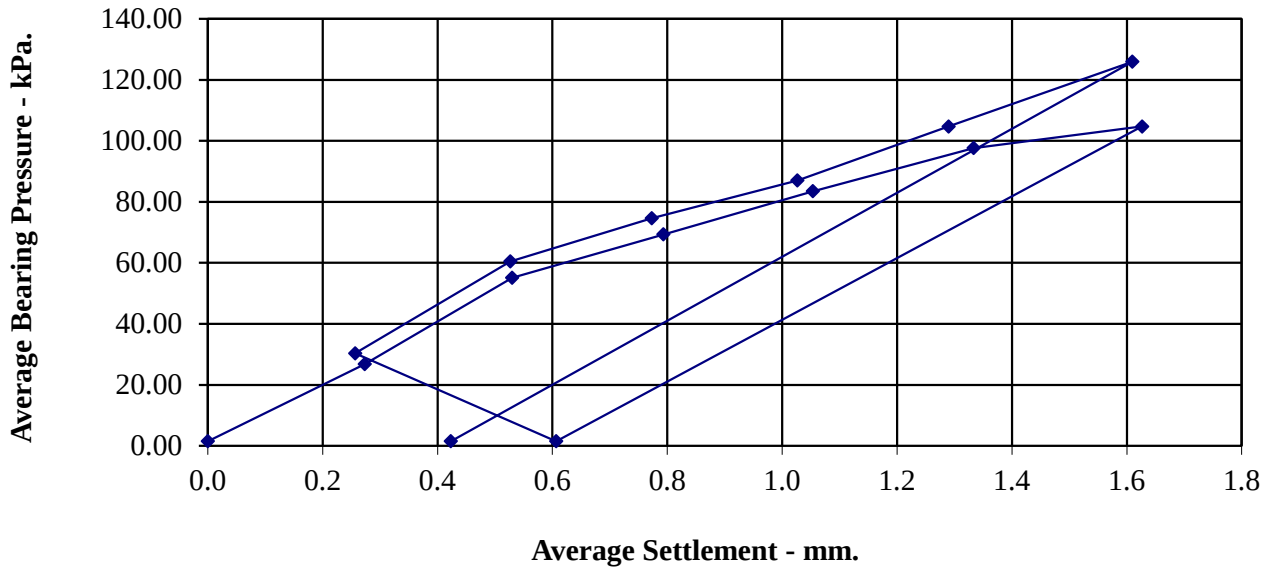
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B15**	
Layer	**L4**	
Comments		
Description	**Brown gravelly SAND.**	
Maximum Deflection	**1.53**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**47**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**30.6**	**$kN/m^2/mm$**
CBR Value	**3.6**	**%**

VERTICAL DEFORMATION TESTS.

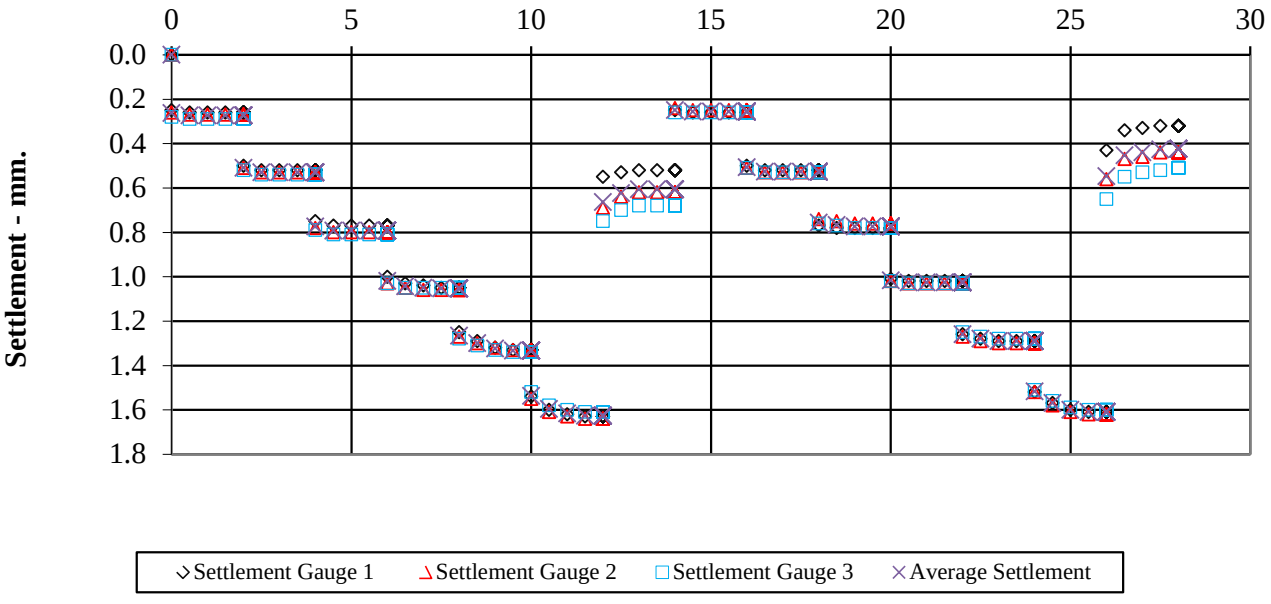
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**E7**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **125.98**
Maximum Deformation (mm): **1.63**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

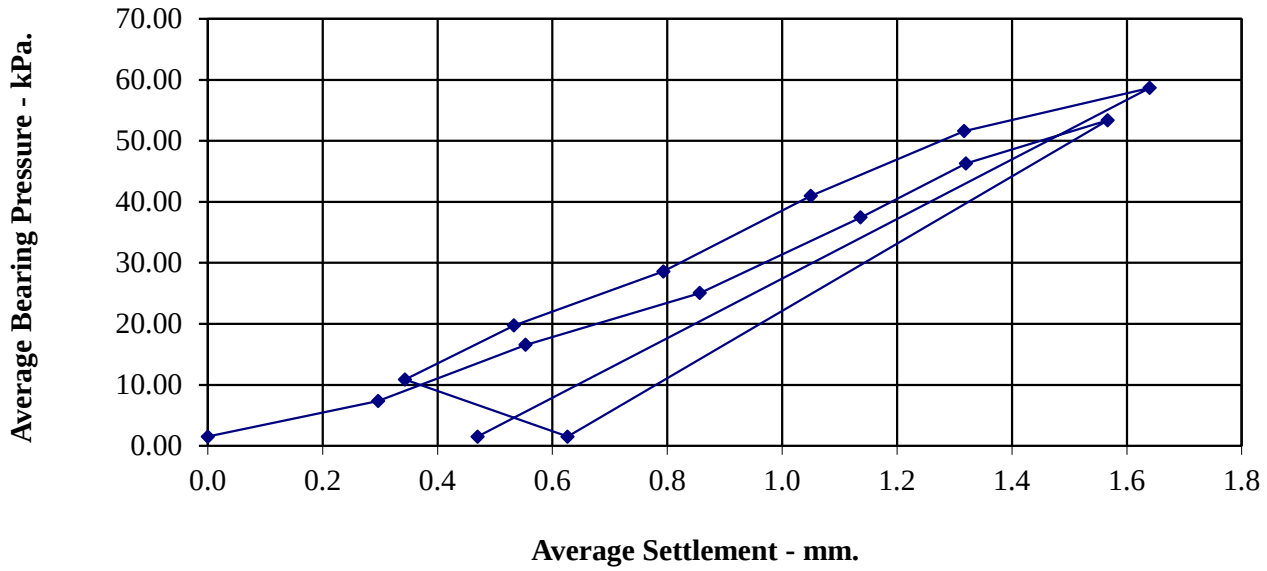
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**E7**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.63**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**93**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**61.0**	**kN/m^2/mm**
CBR Value	**12.0**	**%**

VERTICAL DEFORMATION TESTS.

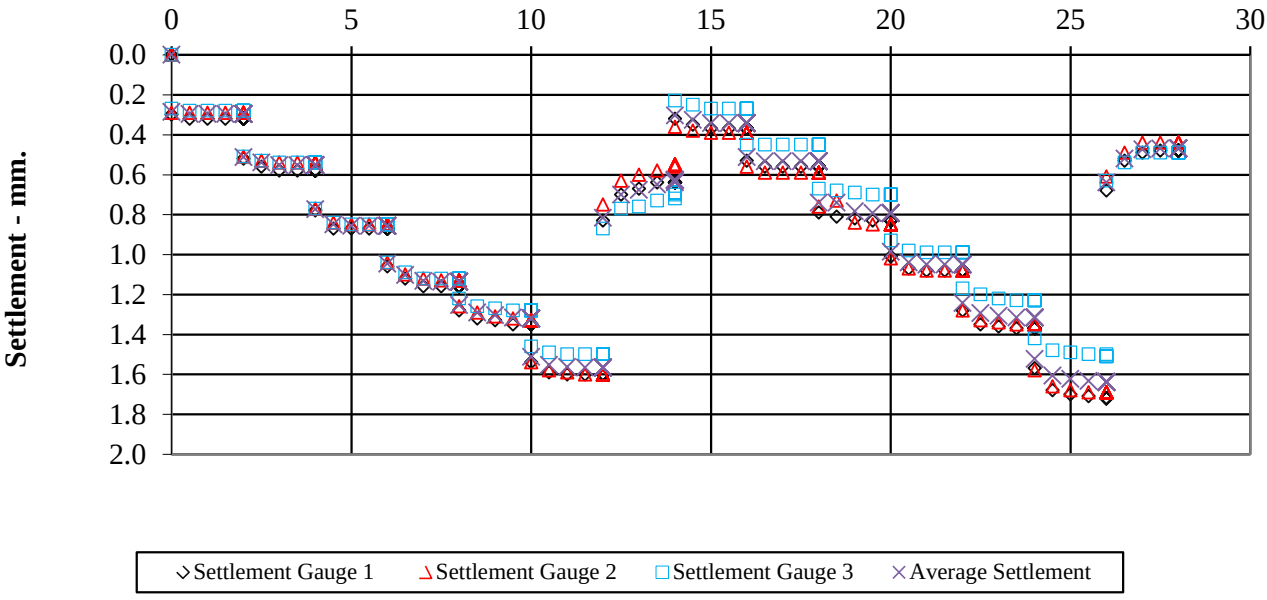
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**G7**	**Depth (m):**	
Layer:	**FL-7**	**Comments:**	

Maximum Applied Pressure (kPa): **58.70**
Maximum Deformation (mm): **1.57**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

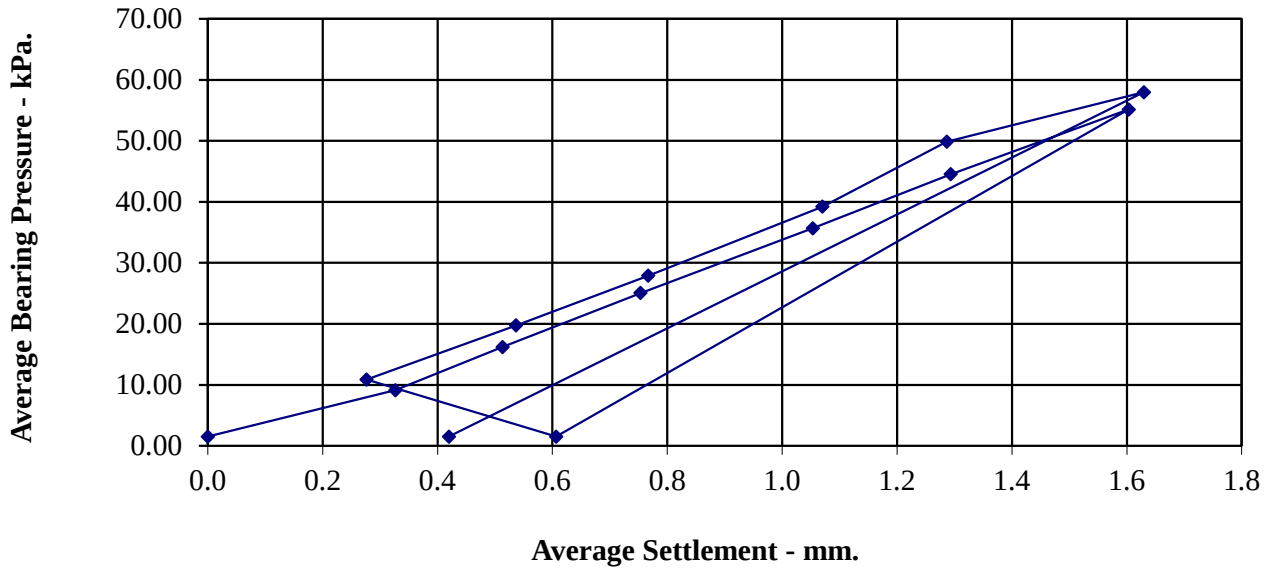
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**G7**	
Layer	**FL-7**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.57**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**43**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**28.0**	**$kN/m^2/mm$**
CBR Value	**3.1**	**%**

VERTICAL DEFORMATION TESTS.

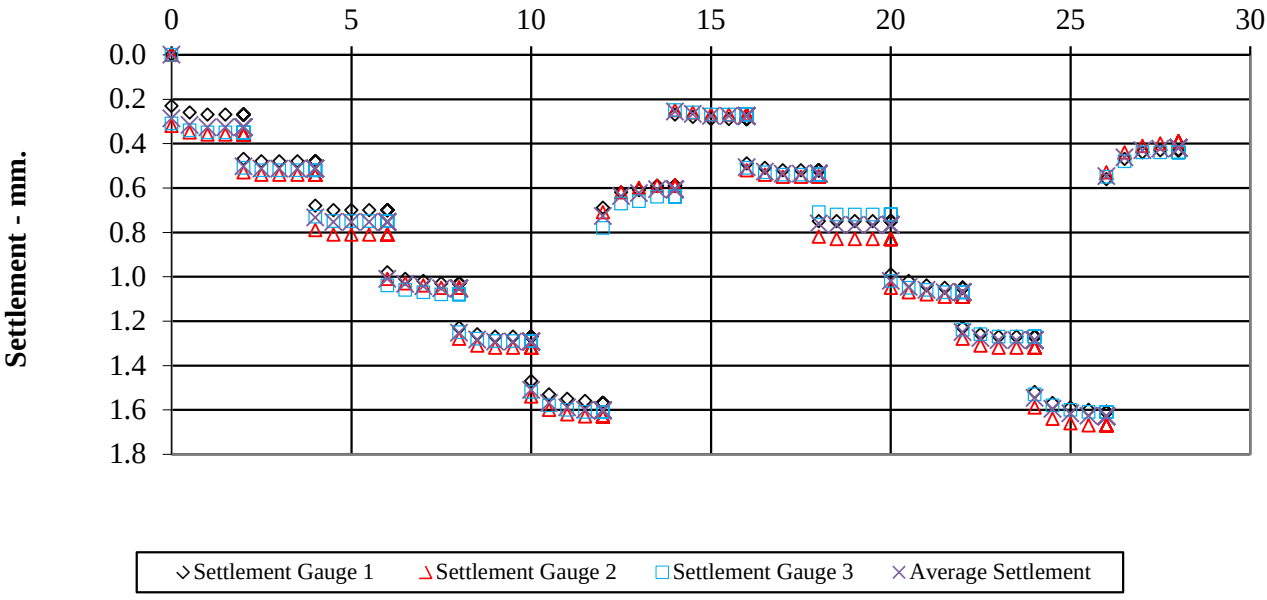
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**G9**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **57.99**
Maximum Deformation (mm): **1.60**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

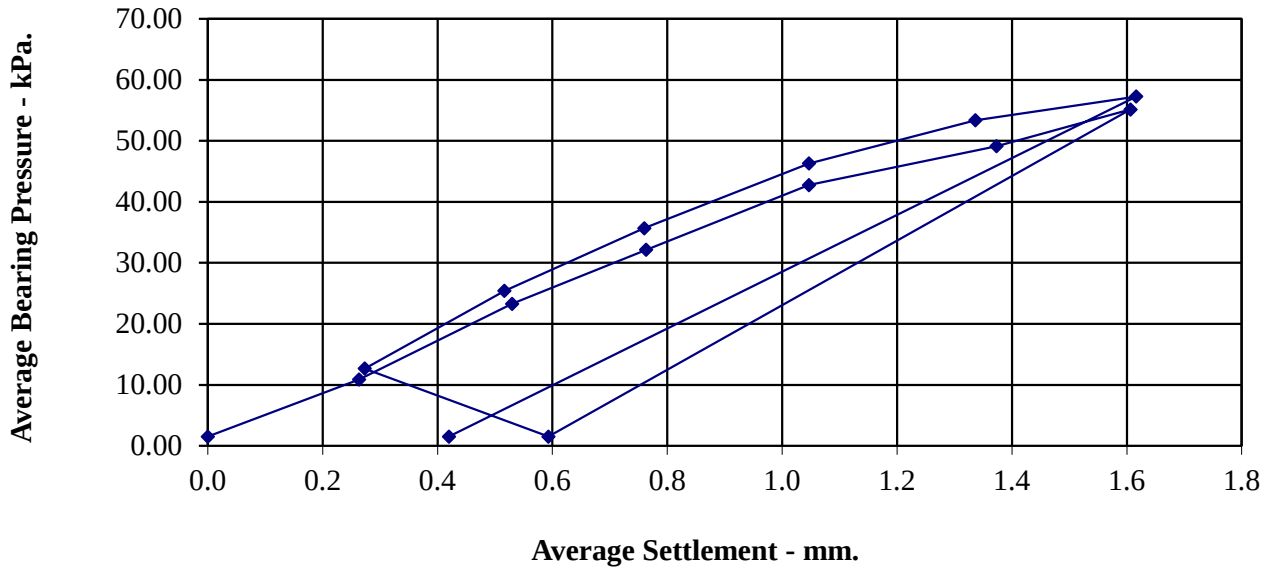
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**G9**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.60**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**43**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**28.0**	**kN/m^2/mm**
CBR Value	**3.1**	**%**

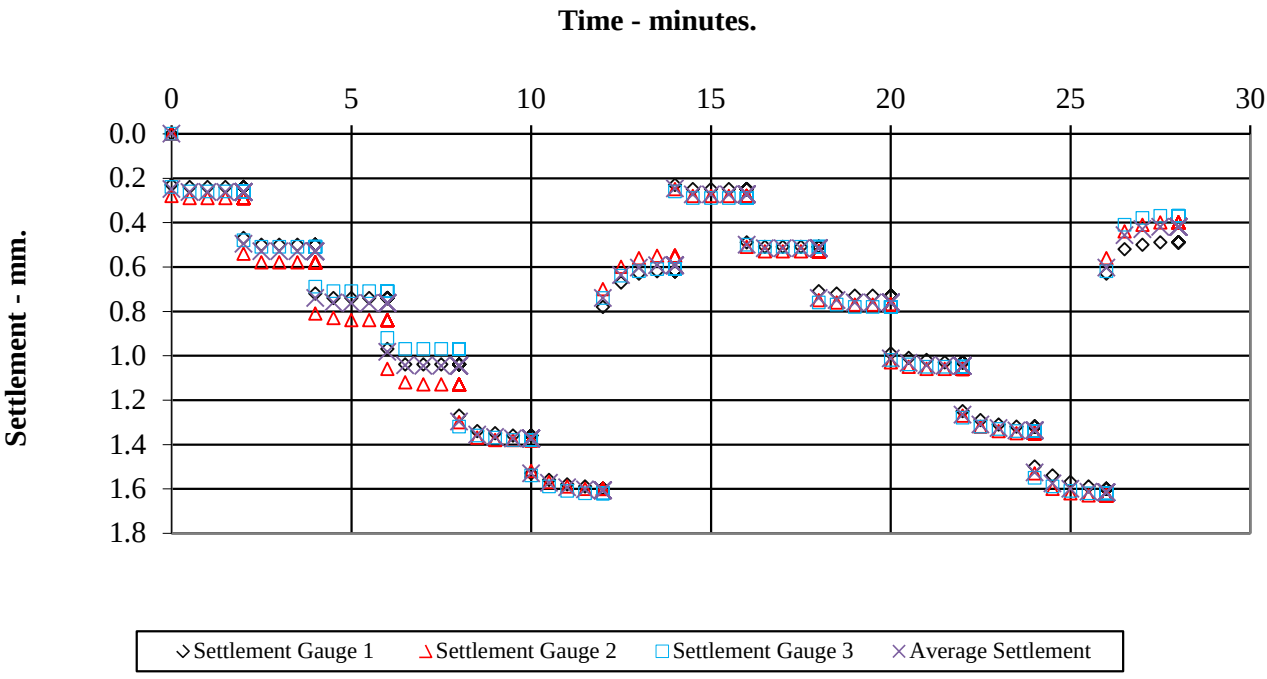
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**I8**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **57.28**
Maximum Deformation (mm): **1.61**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**





UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

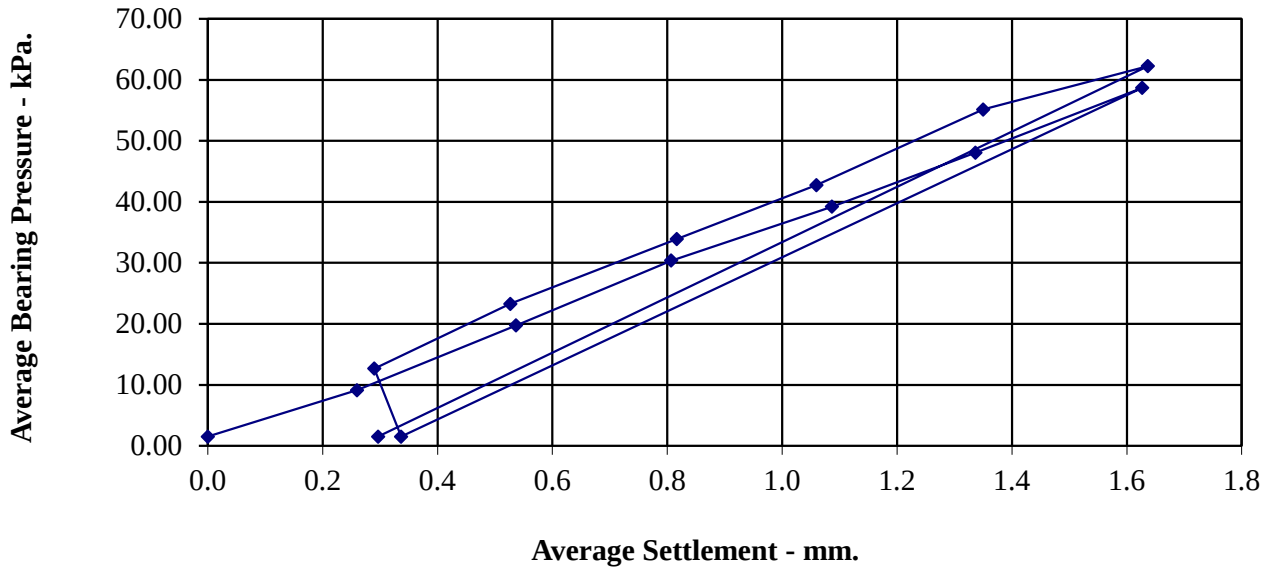
Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I8**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.61**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**47**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**30.5**	**$kN/m^2/mm$**
CBR Value	**3.6**	**%**

VERTICAL DEFORMATION TESTS.

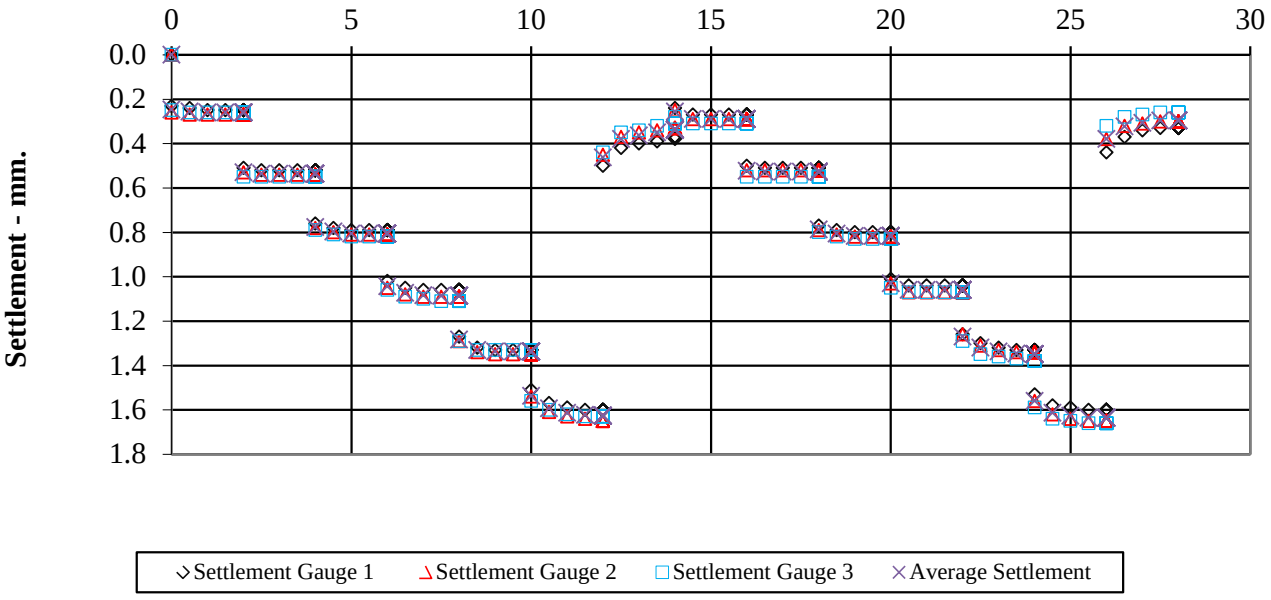
BS 1377 : Part 9 : 1990.

Date of Test:	**15-May-23**	**Test Ref:**	
Grid Ref:	**I9**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **62.24**
Maximum Deformation (mm): **1.63**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**15-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I9**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.63**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**45**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**29.4**	**$kN/m^2/mm$**
CBR Value	**3.4**	**%**

LABORATORY REPORT

Contract Number: PSL23/3603

Report Date: 22 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road, Bolton

Date Received: 16/5/2023
Date Commenced: 16/5/2023
Date Completed: 17/5/2023

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 (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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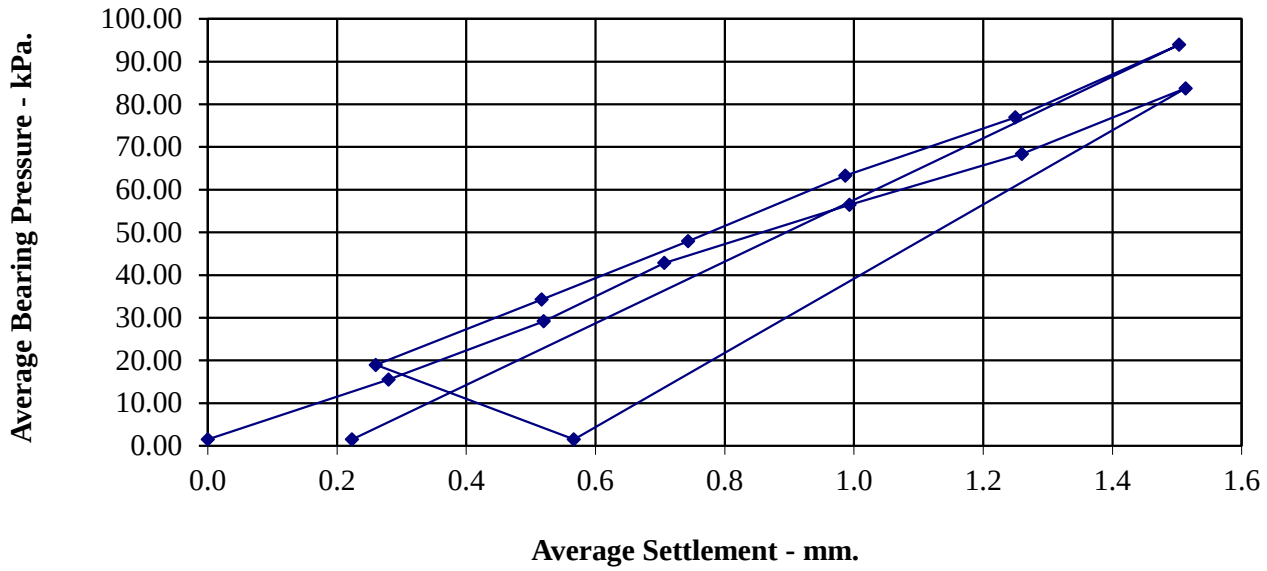
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

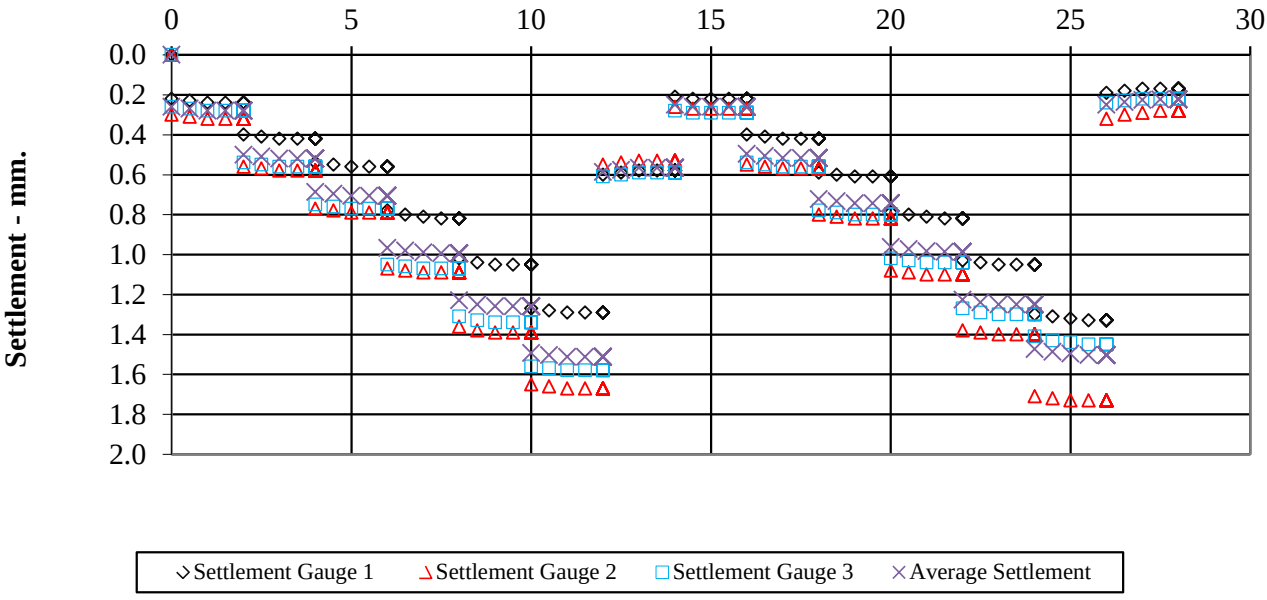
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**B13**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **93.97**
Maximum Deformation (mm): **1.51**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



	Stopes Road, Bolton	**Contract No:** PSL23/3603
		Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

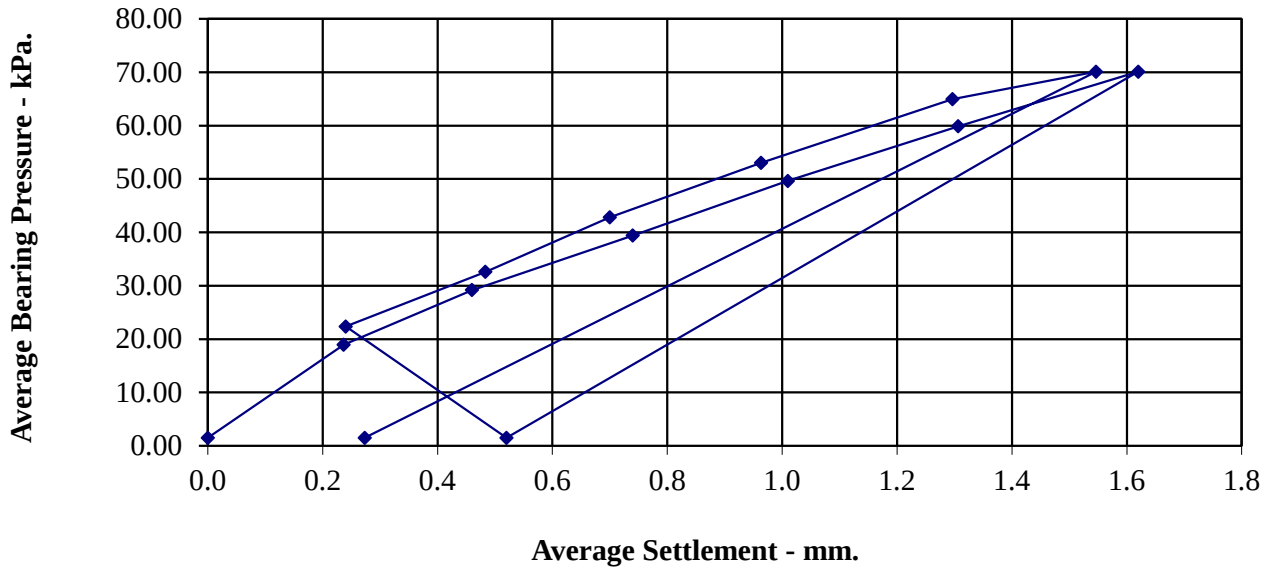
Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B13**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.51**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**68**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**44.4**	**$kN/m^2/mm$**
CBR Value	**6.9**	**%**

VERTICAL DEFORMATION TESTS.

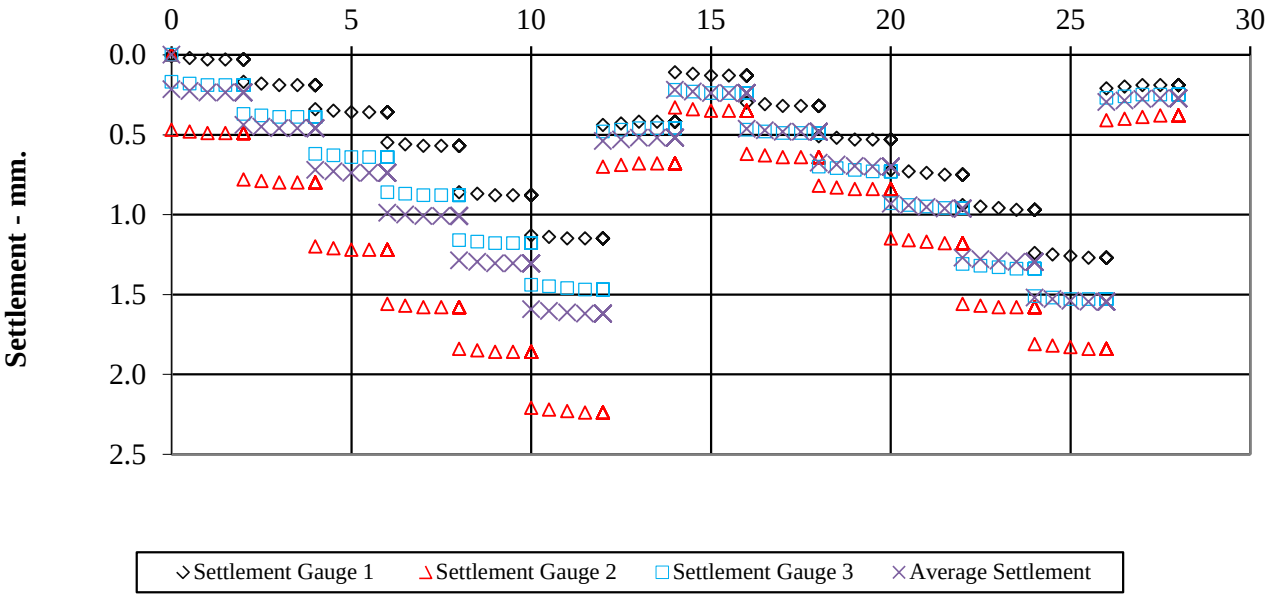
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**F15**	**Depth (m):**	
Layer:	**L4**	**Comments:**	

Maximum Applied Pressure (kPa): **70.10**
Maximum Deformation (mm): **1.62**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3603
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

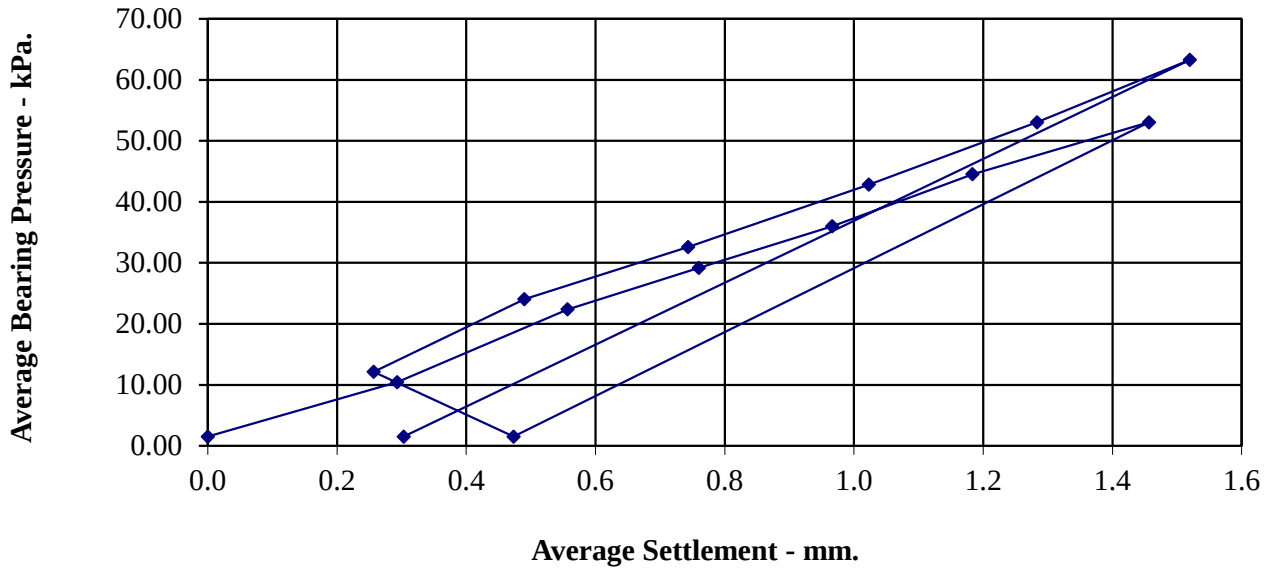
Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**F15**	
Layer	**L4**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.62**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**58**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**37.8**	**kN/m^2/mm**
CBR Value	**5.2**	**%**

VERTICAL DEFORMATION TESTS.

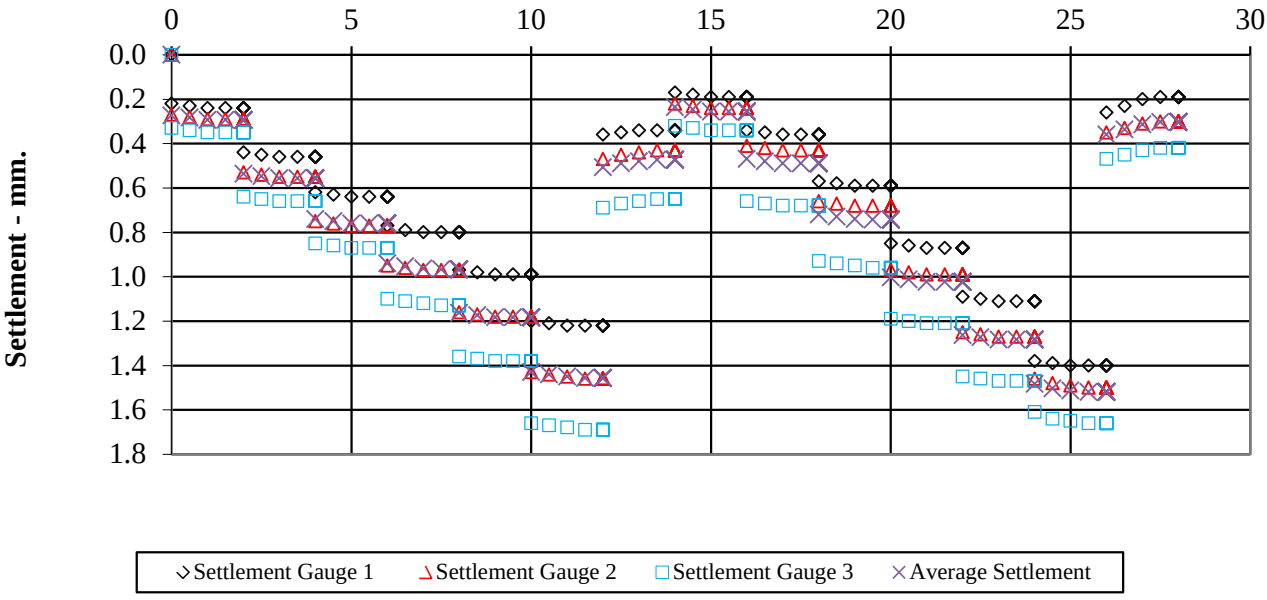
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**G11**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **63.28**
Maximum Deformation (mm): **1.46**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

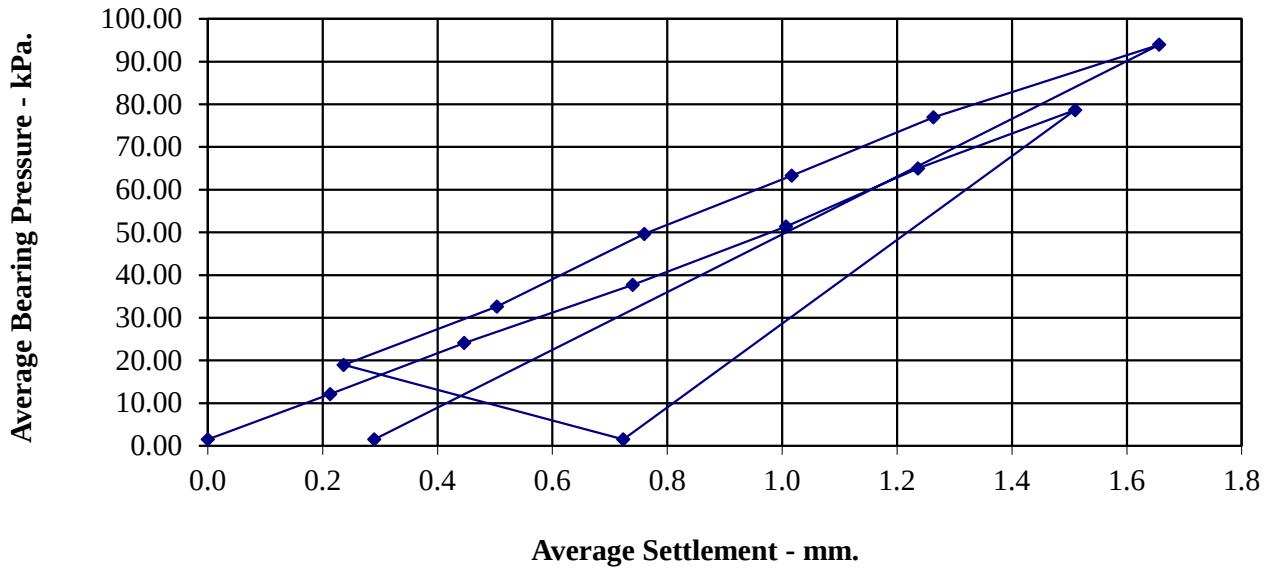
Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**G11**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.46**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**47**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**30.8**	**kN/m^2/mm**
CBR Value	**3.7**	**%**

VERTICAL DEFORMATION TESTS.

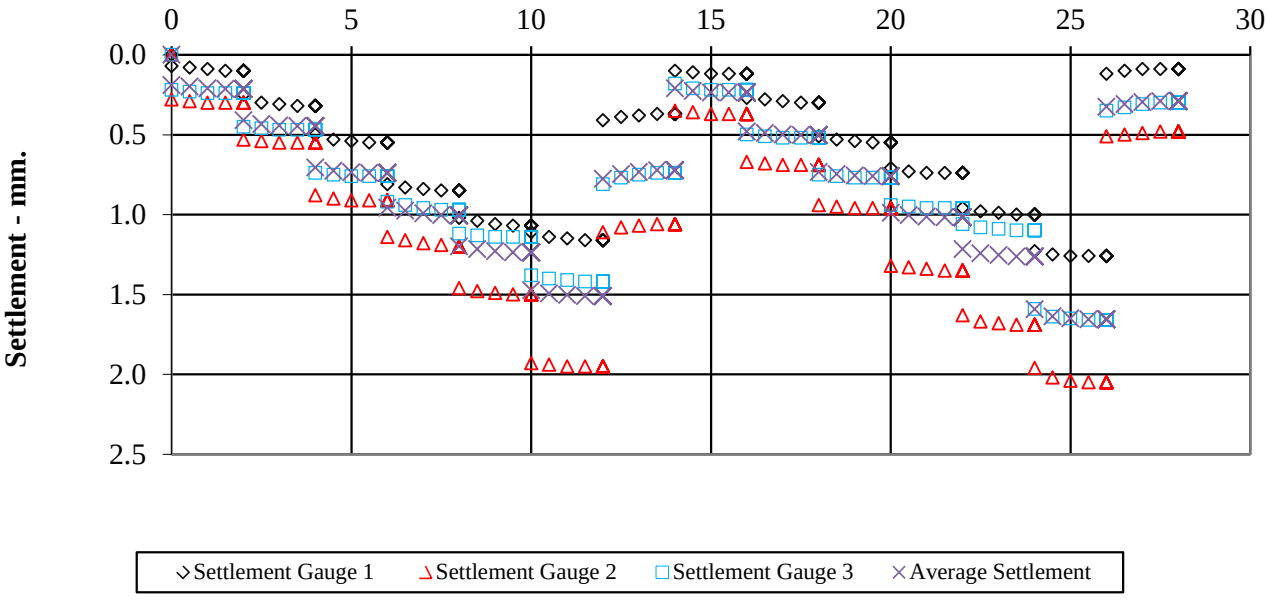
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**G13**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **93.97**
Maximum Deformation (mm): **1.51**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3603
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

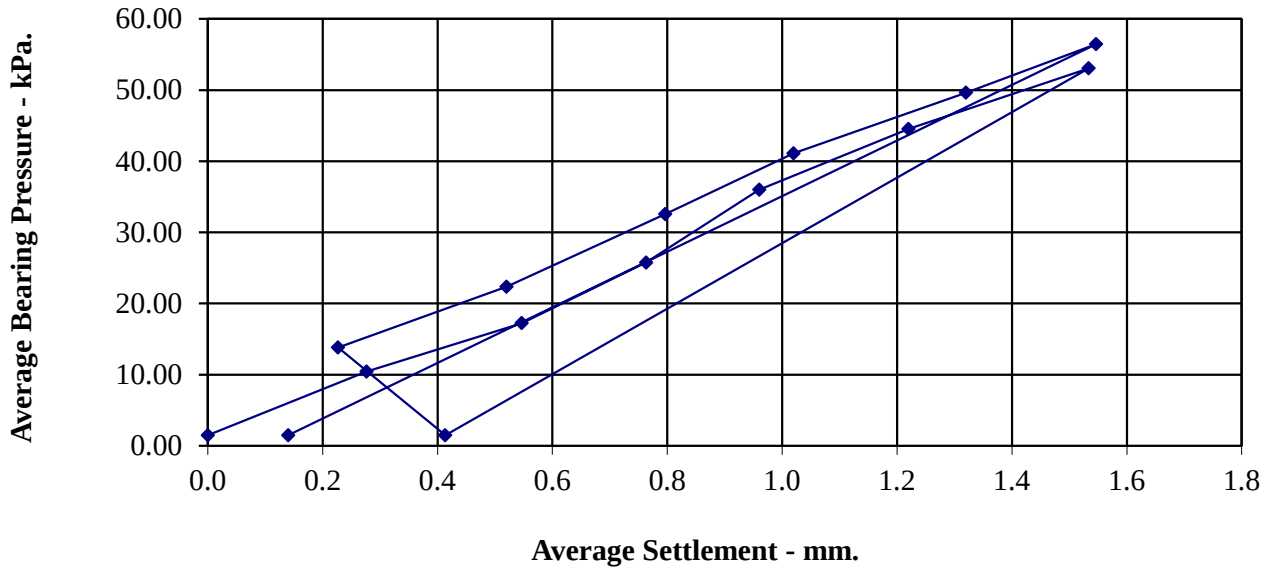
Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**G13**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.51**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**66**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**43.0**	**kN/m^2/mm**
CBR Value	**6.5**	**%**

VERTICAL DEFORMATION TESTS.

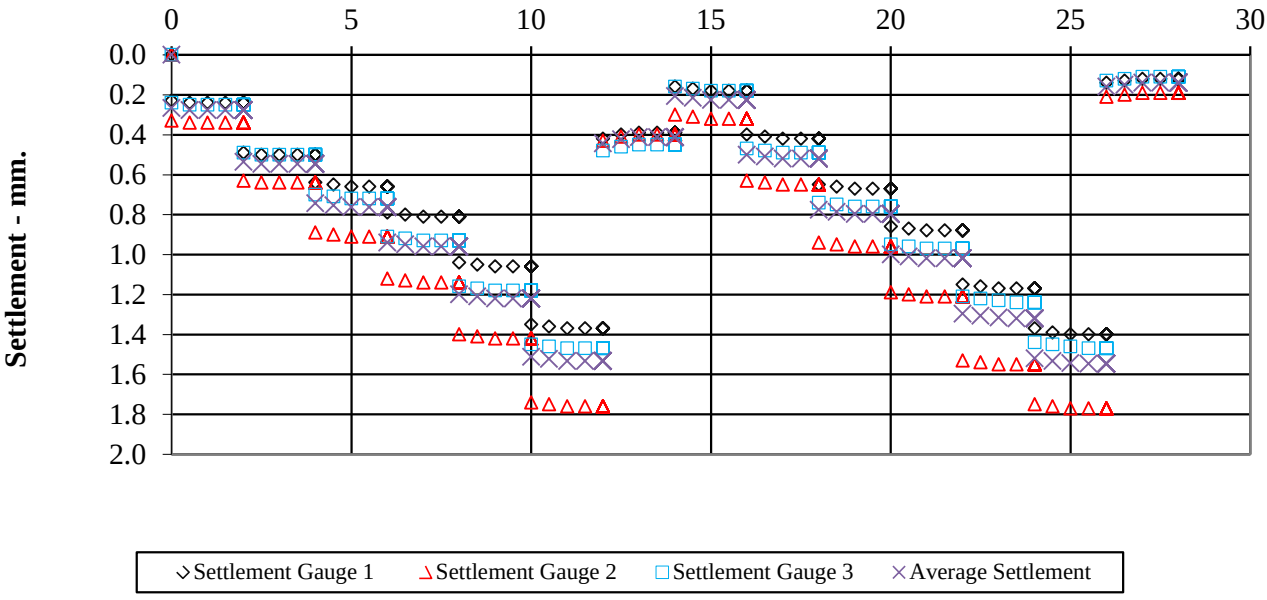
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**I11**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **56.46**
Maximum Deformation (mm): **1.53**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3603 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

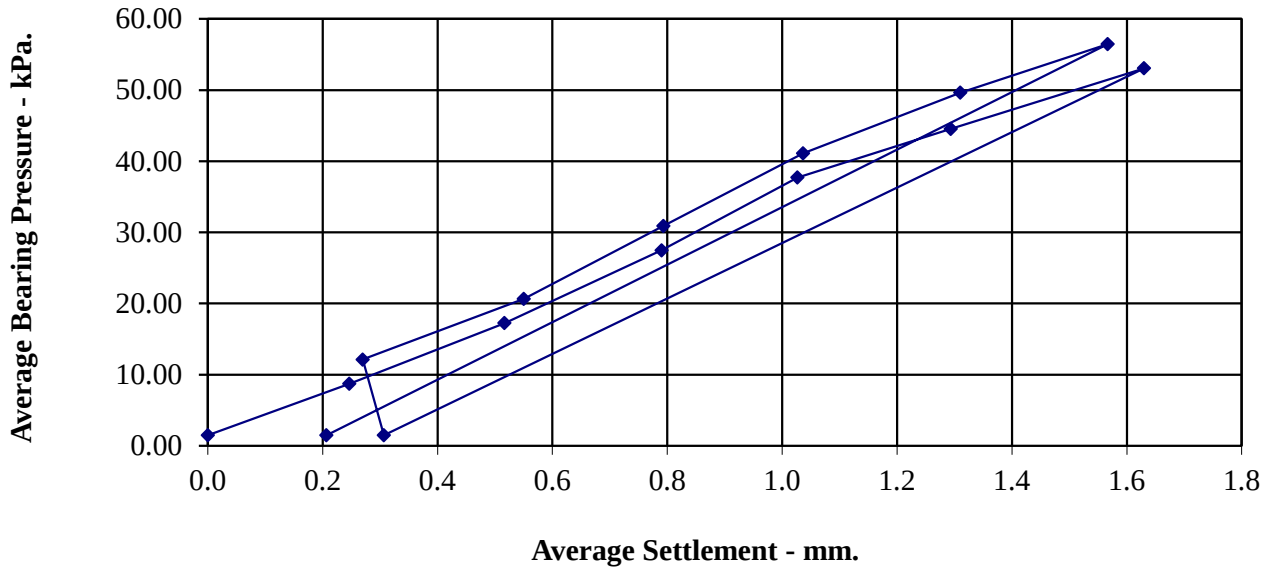
Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I11**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.53**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**46**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**29.7**	**$kN/m^2/mm$**
CBR Value	**3.4**	**%**

VERTICAL DEFORMATION TESTS.

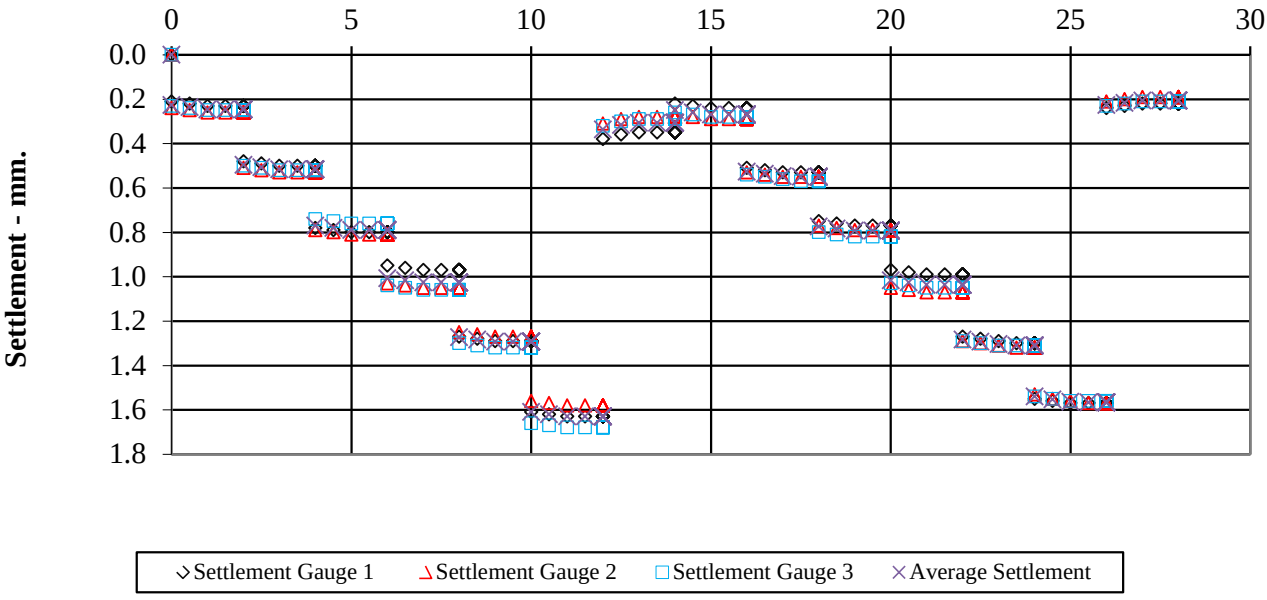
BS 1377 : Part 9 : 1990.

Date of Test:	**16-May-23**	**Test Ref:**	
Grid Ref:	**I13**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **56.46**
Maximum Deformation (mm): **1.63**
Plate Area (m2): **0.2922**
Description: **Brown gravelly sandy CLAY.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3603
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**16-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**I13**	
Layer	**FGL**	
Comments		
Description	**Brown gravelly sandy CLAY.**	
Maximum Deflection	**1.63**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**43**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**28.4**	**$kN/m^2/mm$**
CBR Value	**3.2**	**%**

LABORATORY REPORT

Contract Number: PSL23/3920

Report Date: 24 May 2023

Client's Reference:

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Lane, Radcliffe

Date Received: 23/5/2023
Date Commenced: 23/5/2023
Date Completed: 24/5/2023

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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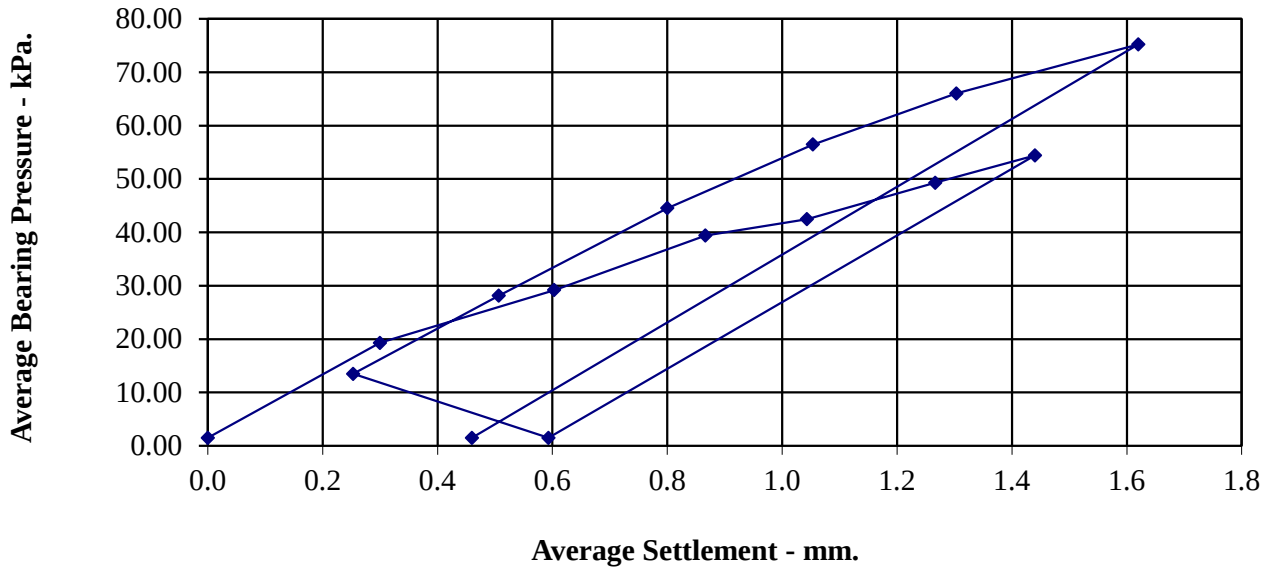
VERTICAL DEFORMATION TESTS.

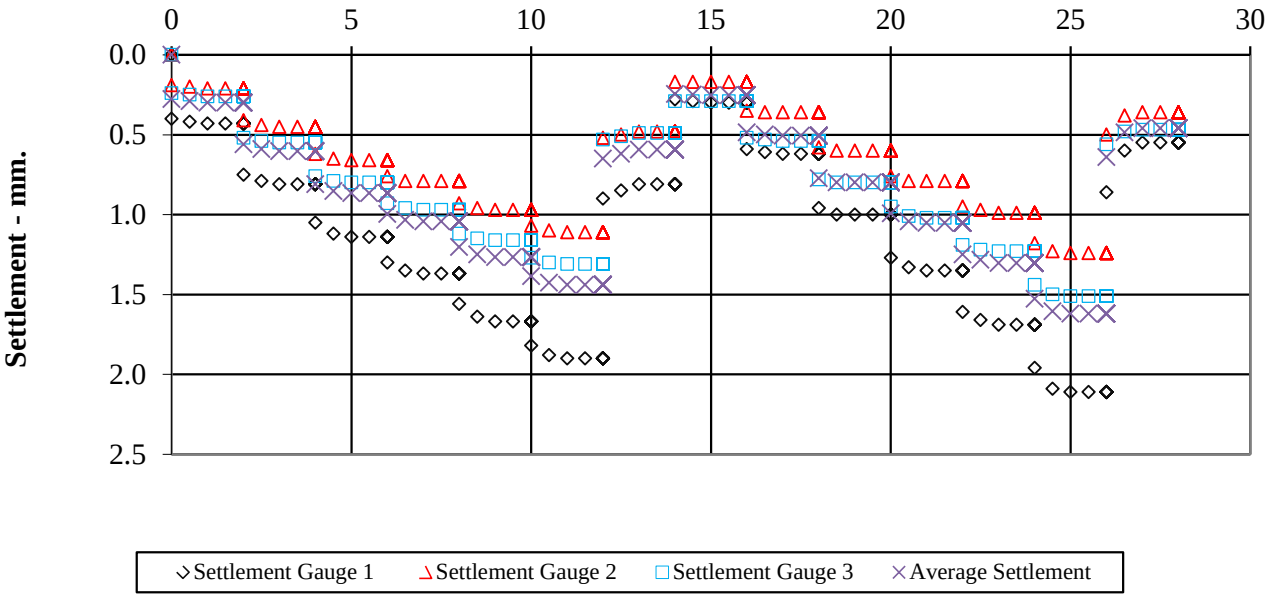
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**B16**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **75.22**
Maximum Deformation (mm): **1.44**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3920
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

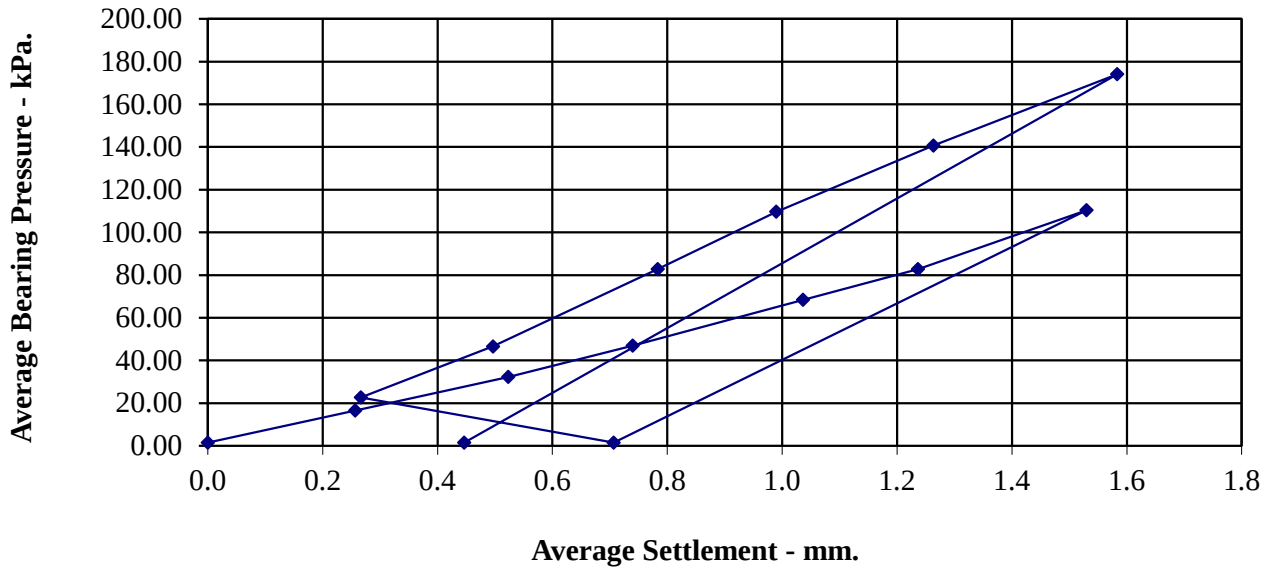
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B16**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.44**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**49**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**31.9**	**$kN/m^2/mm$**
CBR Value	**3.9**	**%**

VERTICAL DEFORMATION TESTS.

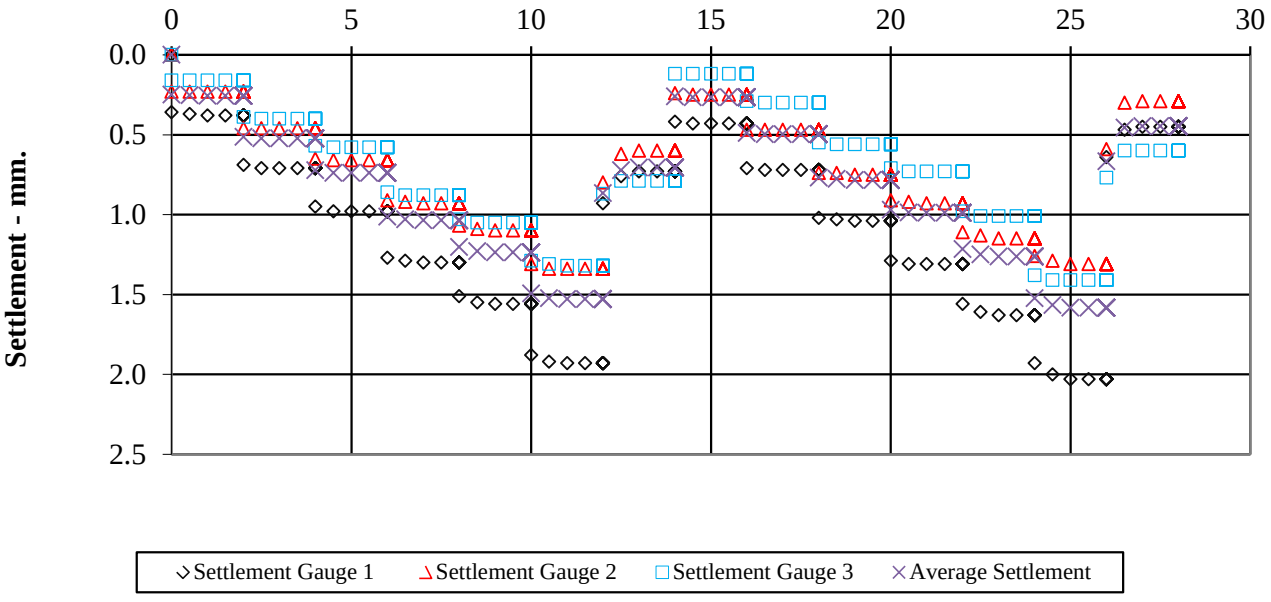
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**B18**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa):	**174.11**
Maximum Deformation (mm):	**1.53**
Plate Area (m2):	**0.2922**
Description:	**Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3920 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

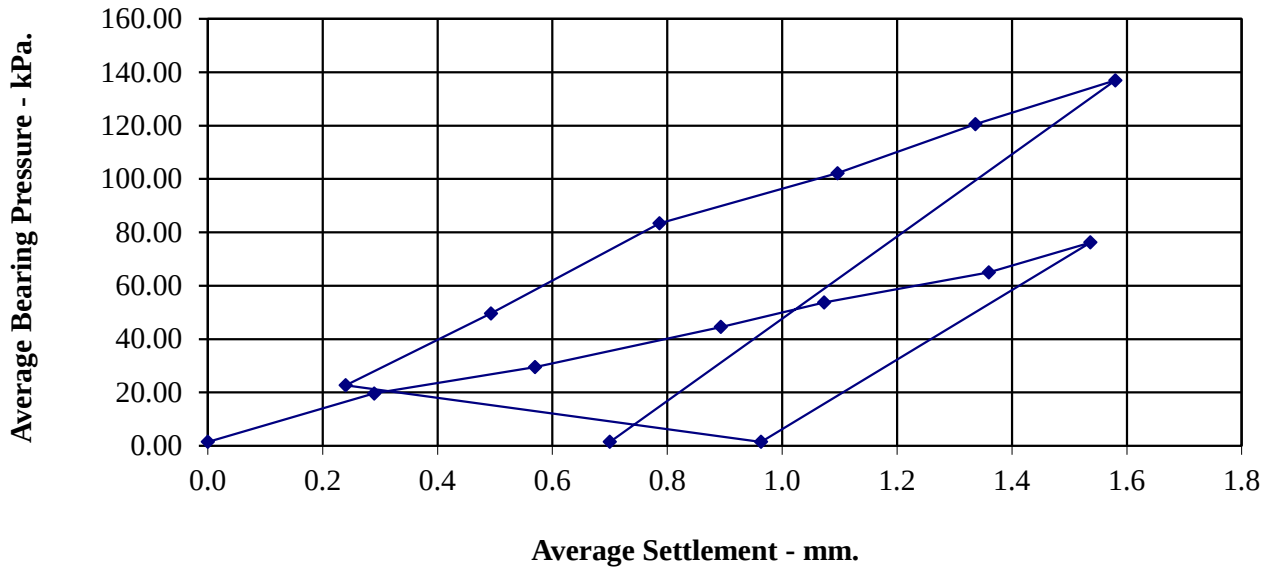
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B18**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.53**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**84**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**54.9**	**$kN/m^2/mm$**
CBR Value	**10.0**	**%**

VERTICAL DEFORMATION TESTS.

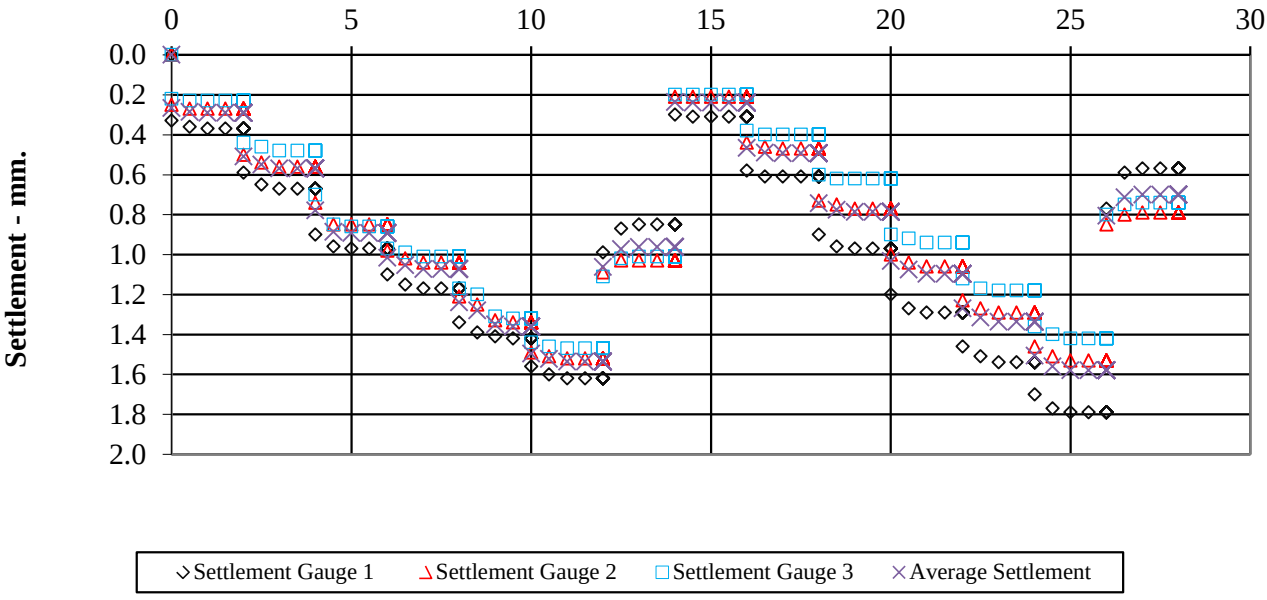
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**B19**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **136.94**
Maximum Deformation (mm): **1.54**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3920 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

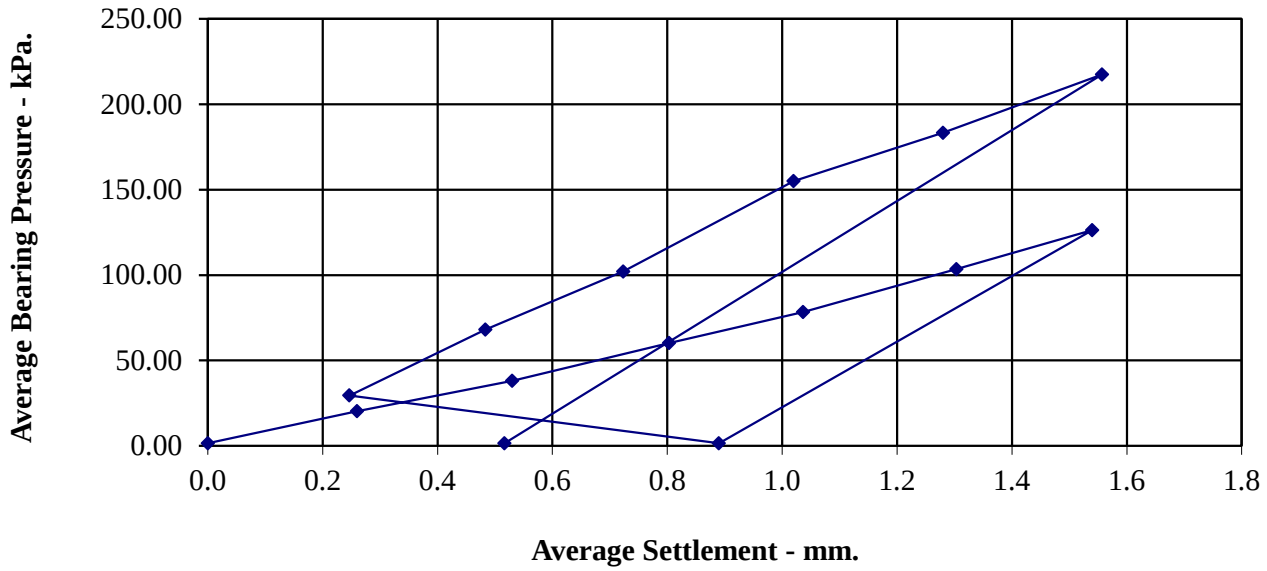
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**B19**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.54**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**61**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**39.6**	**$kN/m^2/mm$**
CBR Value	**5.7**	**%**

VERTICAL DEFORMATION TESTS.

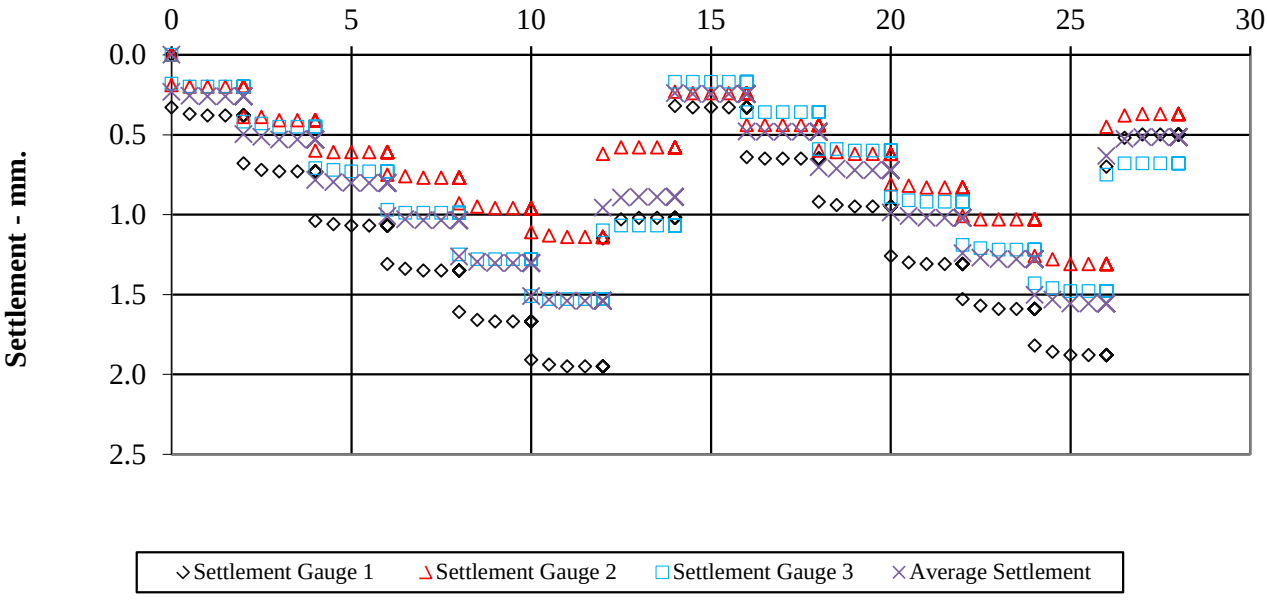
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**C16**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **217.42**
Maximum Deformation (mm): **1.54**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3920
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

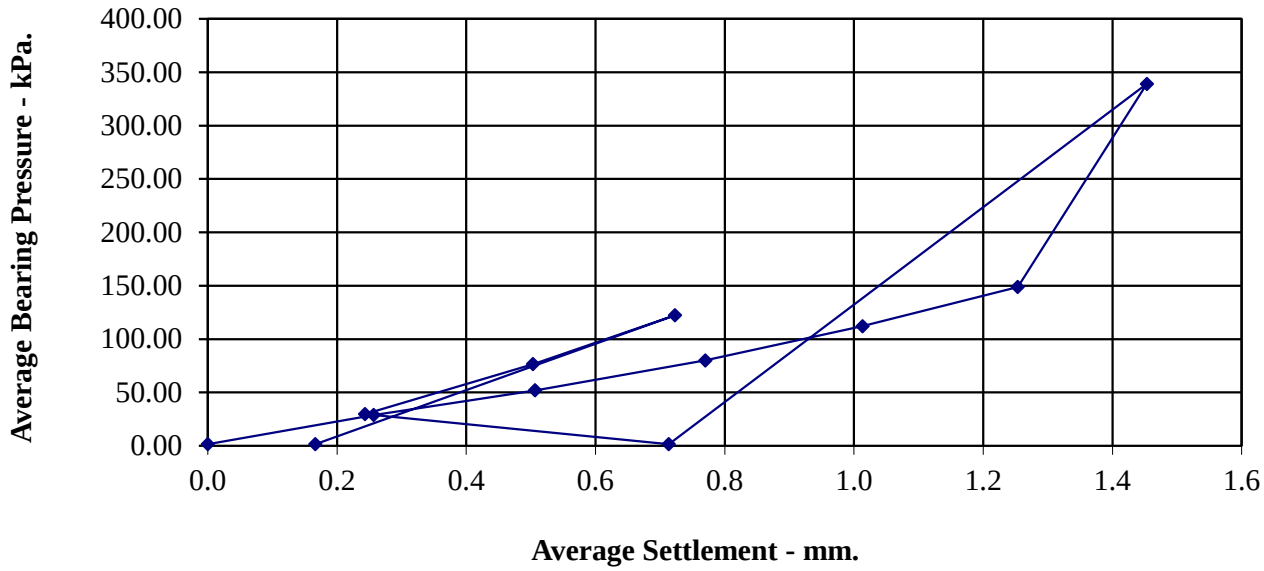
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**C16**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.54**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**98**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**64.3**	**kN/m^2/mm**
CBR Value	**13.1**	**%**

VERTICAL DEFORMATION TESTS.

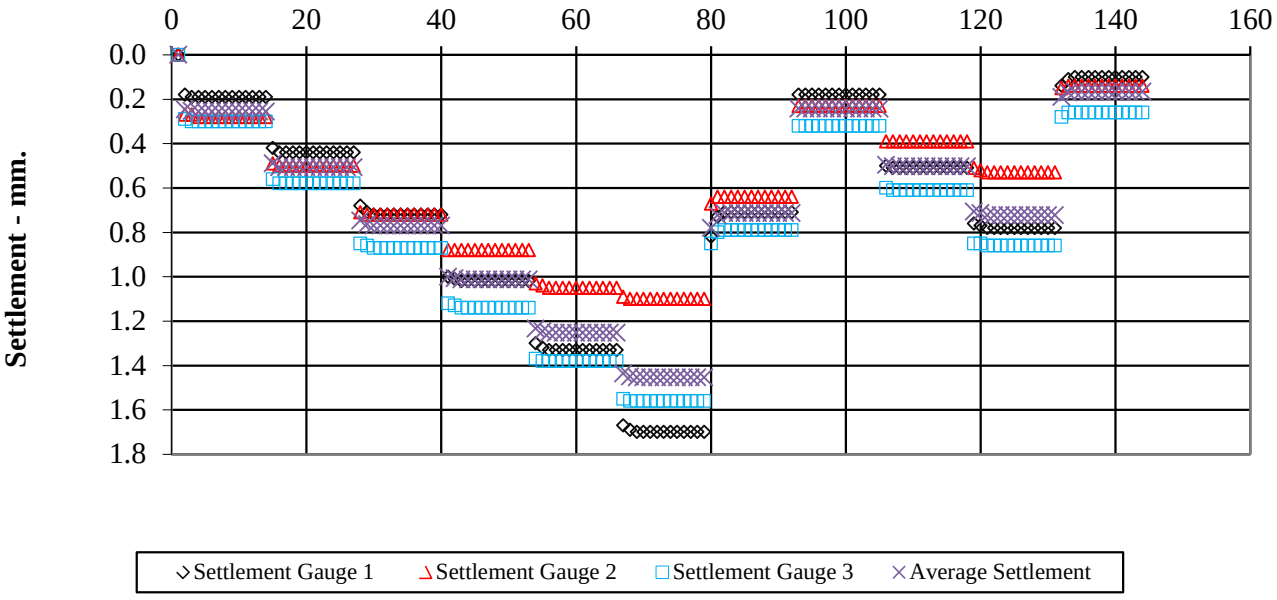
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**C18**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **339.16**
Maximum Deformation (mm): **1.45**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY	**Stopes Road, Bolton**	**Contract No:** PSL23/3920 **Client Ref:**

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

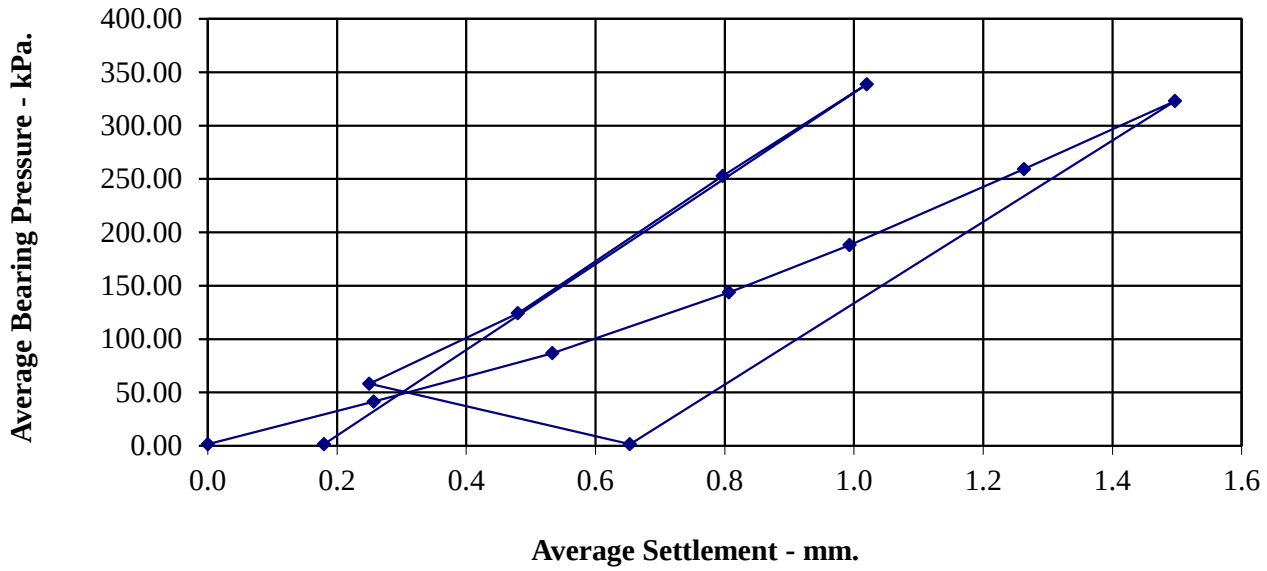
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**C18**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.45**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**148**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**96.9**	**$kN/m^2/mm$**
CBR Value	**26.7**	**%**

VERTICAL DEFORMATION TESTS.

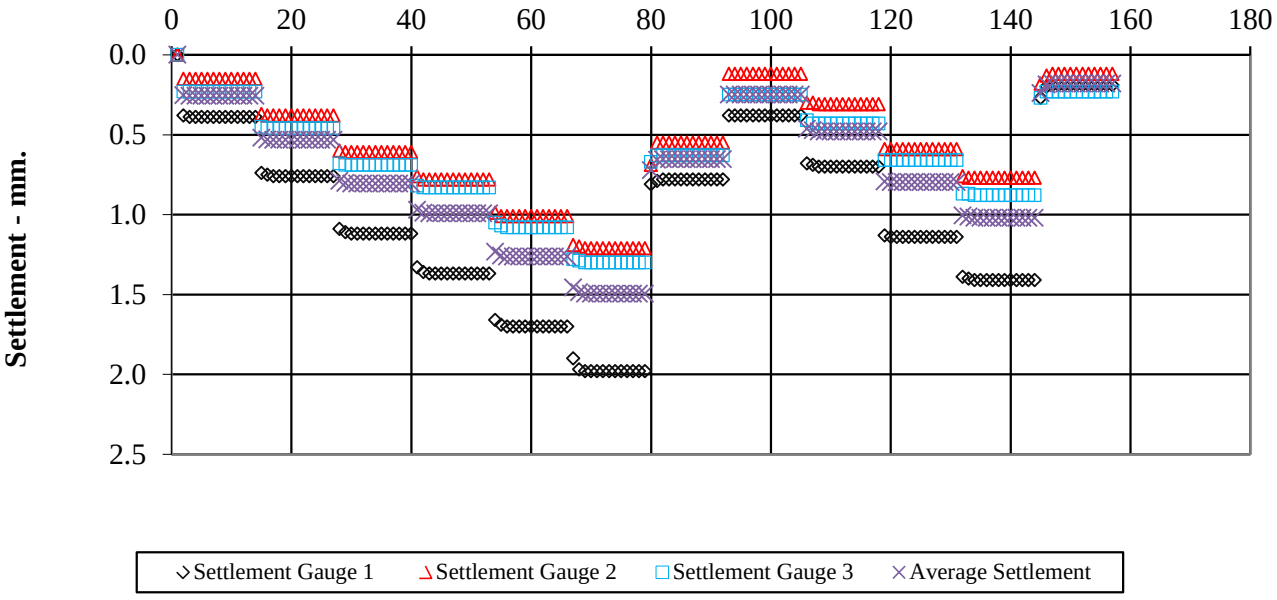
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**C19**	**Depth (m):**	
Layer:	**FGL**	**Comments:**	

Maximum Applied Pressure (kPa): **338.82**
Maximum Deformation (mm): **1.50**
Plate Area (m2): **0.2922**
Description: **Dark grey gravelly SAND.**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3920
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

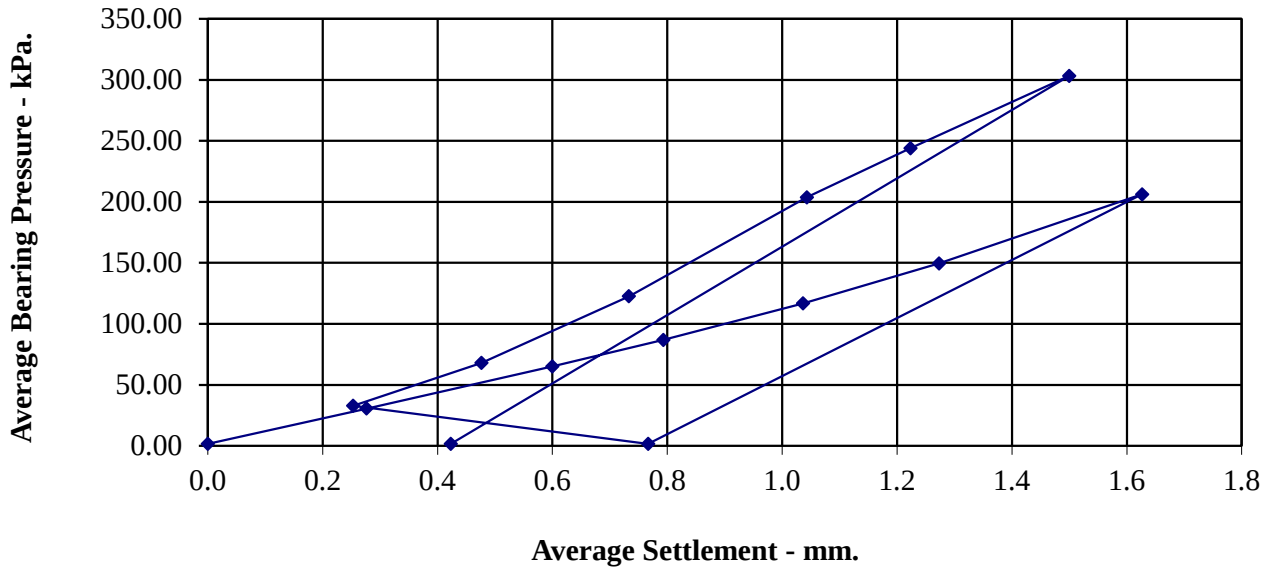
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**C19**	
Layer	**FGL**	
Comments		
Description	**Dark grey gravelly SAND.**	
Maximum Deflection	**1.50**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**256**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**167.1**	**$kN/m^2/mm$**
CBR Value	**68.7**	**%**

VERTICAL DEFORMATION TESTS.

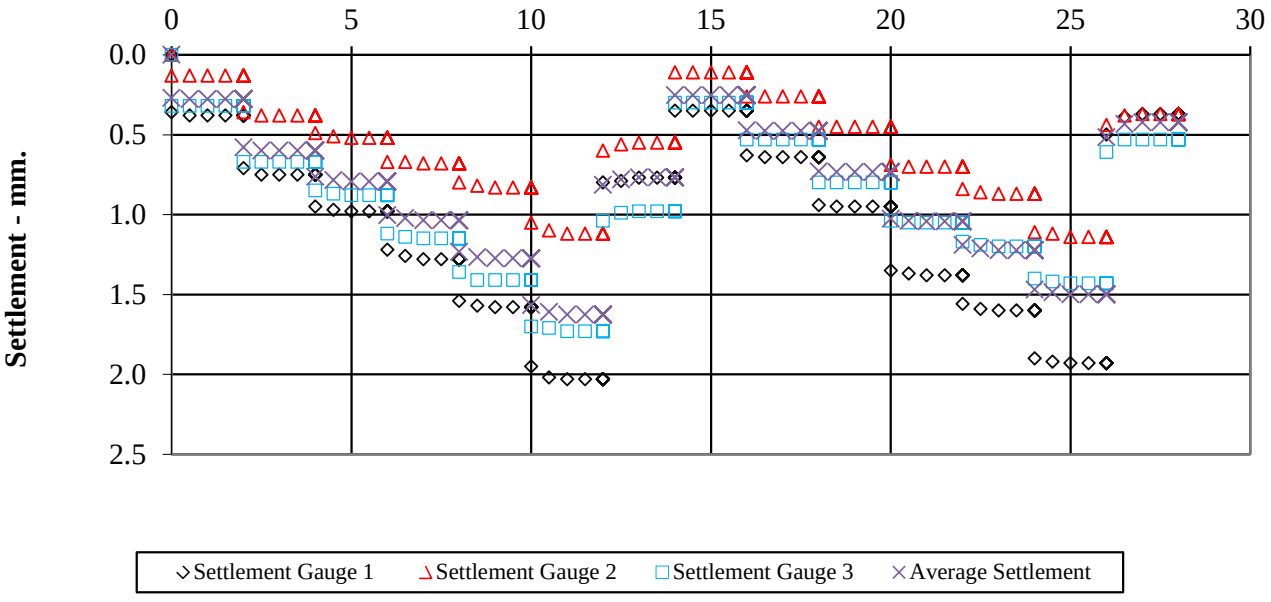
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**F7**	**Depth (m):**	
Layer:	**4**	**Comments:**	

Maximum Applied Pressure (kPa): **303.36**
Maximum Deformation (mm): **1.63**
Plate Area (m2): **0.2922**
Description: **P.O.S CLAY**



Time - minutes.



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY

Stopes Road, Bolton

Contract No:
PSL23/3920
Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

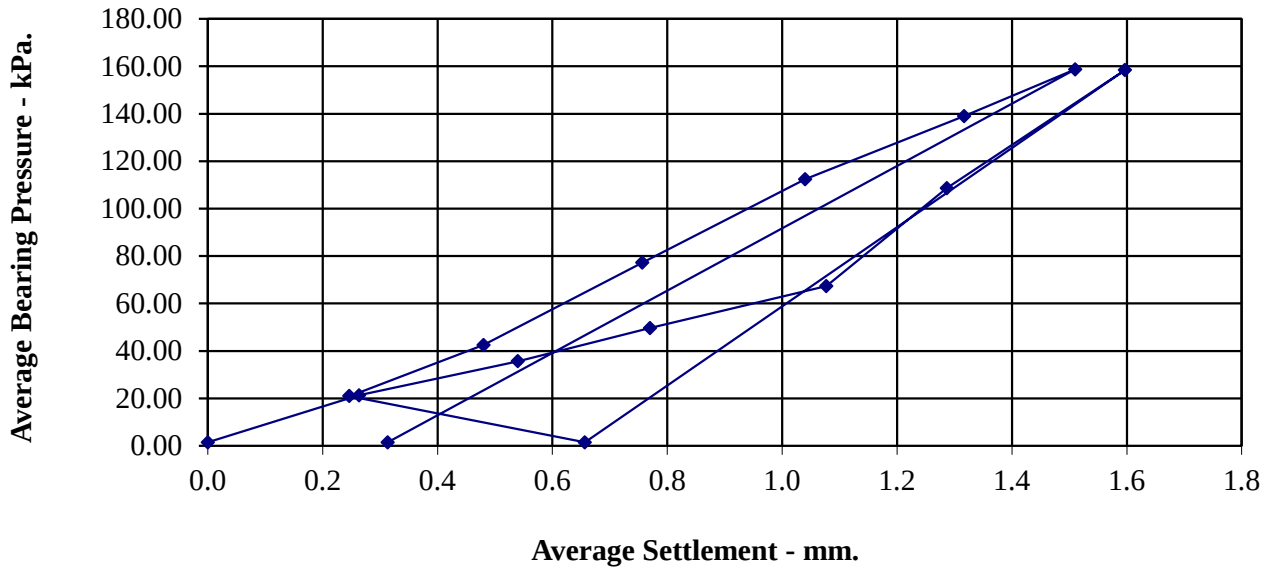
Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**F7**	
Layer	**4**	
Comments		
Description	**P.O.S CLAY**	
Maximum Deflection	**1.63**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**146**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**95.6**	**$kN/m^2/mm$**
CBR Value	**26.1**	**%**

VERTICAL DEFORMATION TESTS.

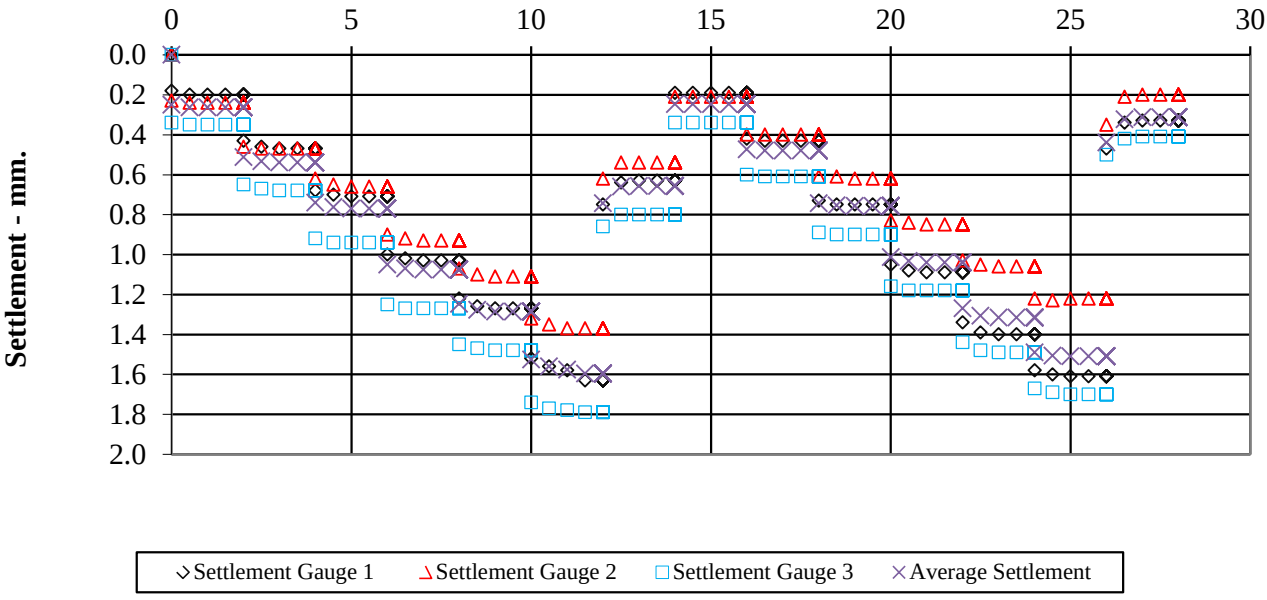
BS 1377 : Part 9 : 1990.

Date of Test:	**23-May-23**	**Test Ref:**	
Grid Ref:	**F15**	**Depth (m):**	
Layer:	**4**	**Comments:**	

Maximum Applied Pressure (kPa): **158.77**
Maximum Deformation (mm): **1.60**
Plate Area (m2): **0.2922**
Description: **P.O.S CLAY**



Time - minutes.



	Stopes Road, Bolton	**Contract No:**
		PSL23/3920
		Client Ref:

Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**23-May-23**	
Test Ref		
Depth (m)		
Grid Ref	**F15**	
Layer	**4**	
Comments		
Description	**P.O.S CLAY**	
Maximum Deflection	**1.60**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**101**	**kN/m^2**
Plate diameter	**610**	**mm**
Conversion factor for plate diameter	**0.816**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**66.3**	**$kN/m^2/mm$**
CBR Value	**13.8**	**%**

LABORATORY REPORT

Contract Number: PSL23/4203

Report Date: 09 June 2023

Client's Reference: 808

Client Name: VHE
Wahley Road
Barnsley
South Yorkshire
S75 1HT

For the attention of: Hassan Masoum

Contract Title: Stopes Road

Date Received: 2/6/2023
Date Commenced: 2/6/2023
Date Completed: 9/6/2023

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 (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
Area D-1	1	B			Brown gravelly very sandy CLAY.
Area D-2	2	B			Brown very gravelly very sandy CLAY.
Area D-3	3	B			Brown gravelly very sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road	Contract No:
	PSL23/4203
	Client Ref:
	808

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
Area D-1	1	B			11		32	16	16	78	Low Plasticity CL
Area D-2	2	B			9.3		30	15	15	73	Low Plasticity CL
Area D-3	3	B			8.6		25	14	11	76	Low Plasticity CL

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PREMIER GROUP COMPANY

Stopes Road

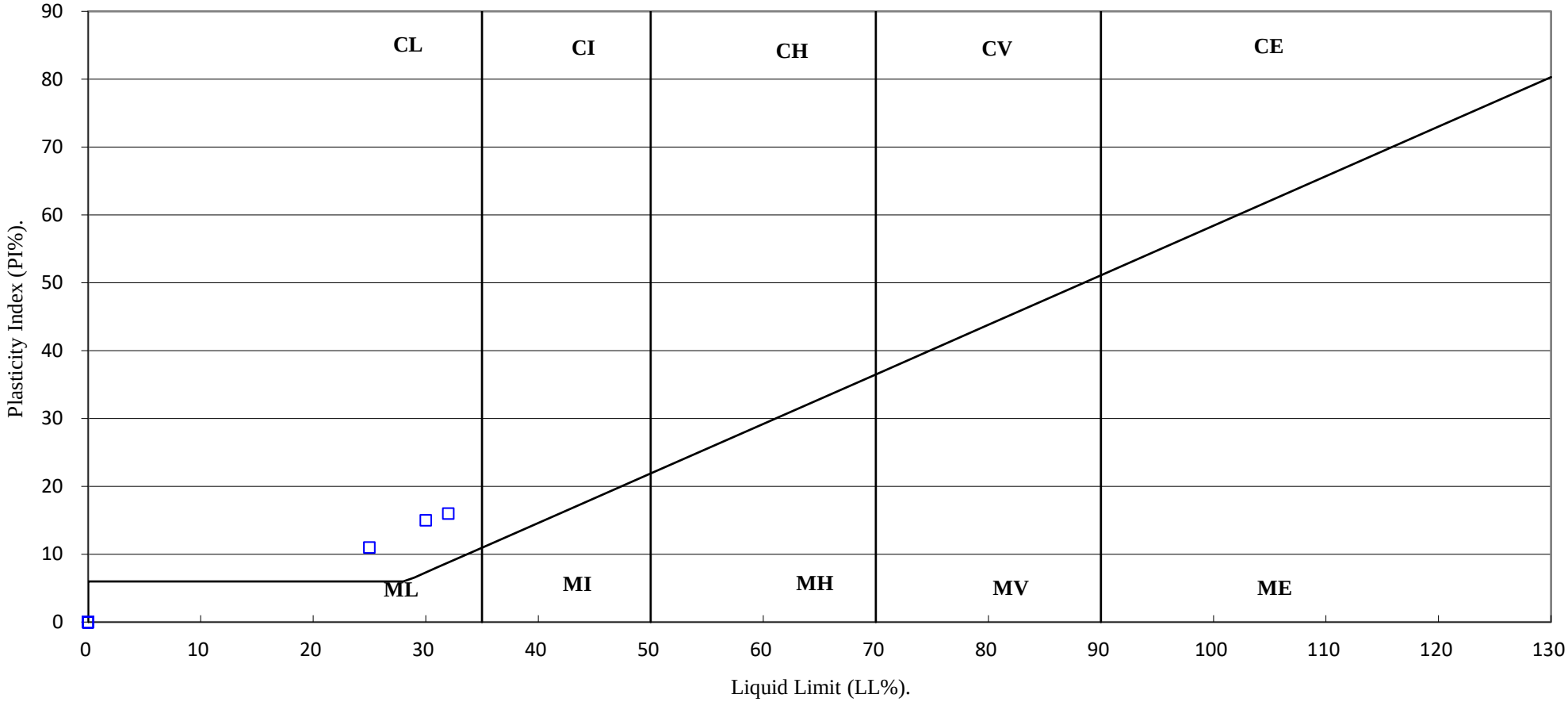
Contract No:

PSL23/4203

Client Ref:

808

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PREMIER GROUP COMPANY	**Stopes Road**	**Contract No:** PSL23/4203 **Client Ref:** 808

PARTICLE SIZE DISTRIBUTION TEST

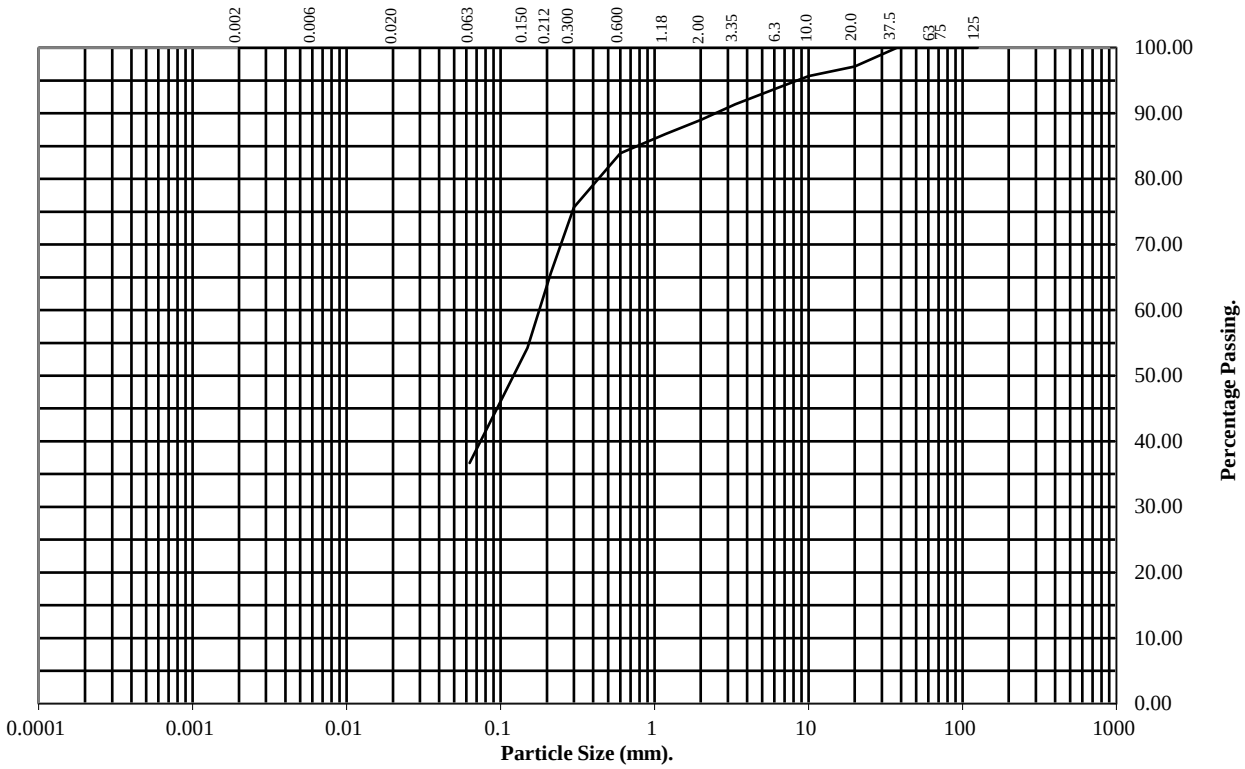
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **Area D-1** **Top Depth (m):**

Sample Number: **1** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	96
6.3	94
3.35	91
2	89
1.18	87
0.6	84
0.3	76
0.212	66
0.15	54
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	52
Silt/Clay	37

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road

Contract No: **PSL23/4203**

Client Ref: **808**

PARTICLE SIZE DISTRIBUTION TEST

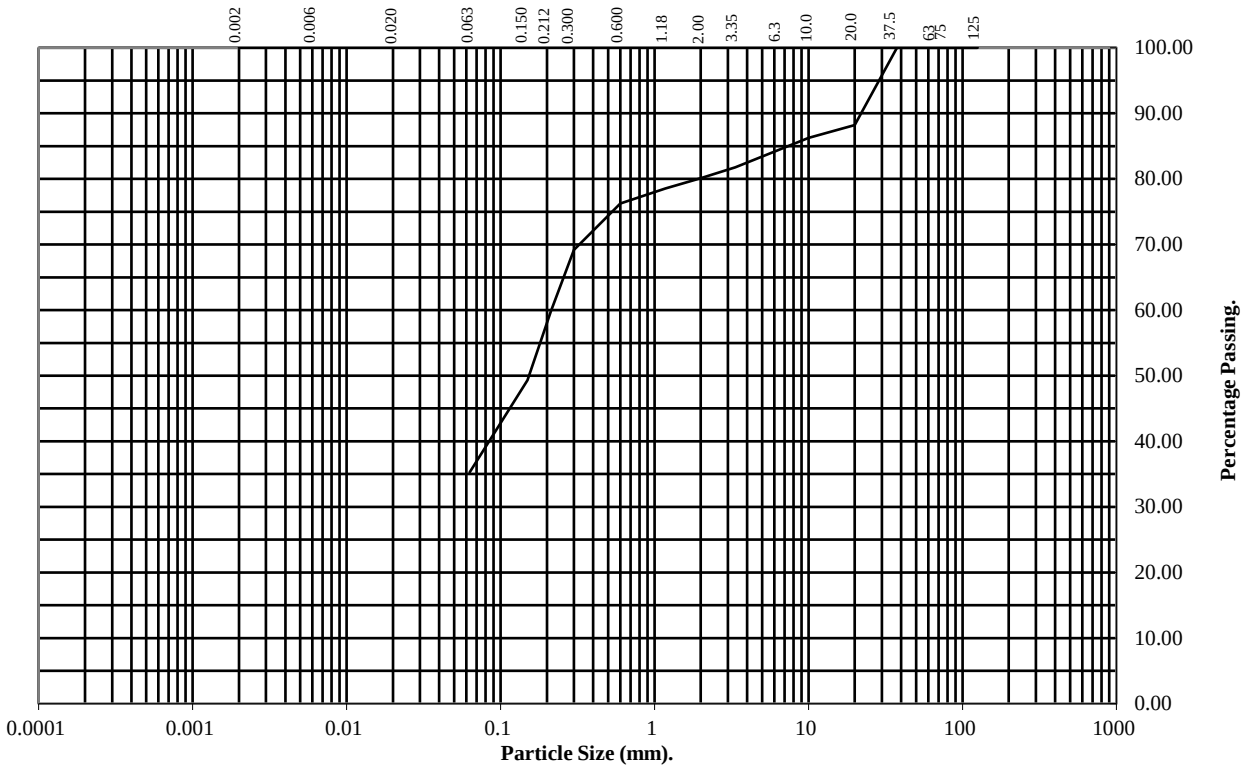
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **Area D-2** **Top Depth (m):**

Sample Number: **2** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	86
6.3	84
3.35	82
2	80
1.18	79
0.6	76
0.3	69
0.212	60
0.15	49
0.063	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	20
Sand	45
Silt/Clay	35

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road

Contract No: PSL23/4203

Client Ref: 808

PARTICLE SIZE DISTRIBUTION TEST

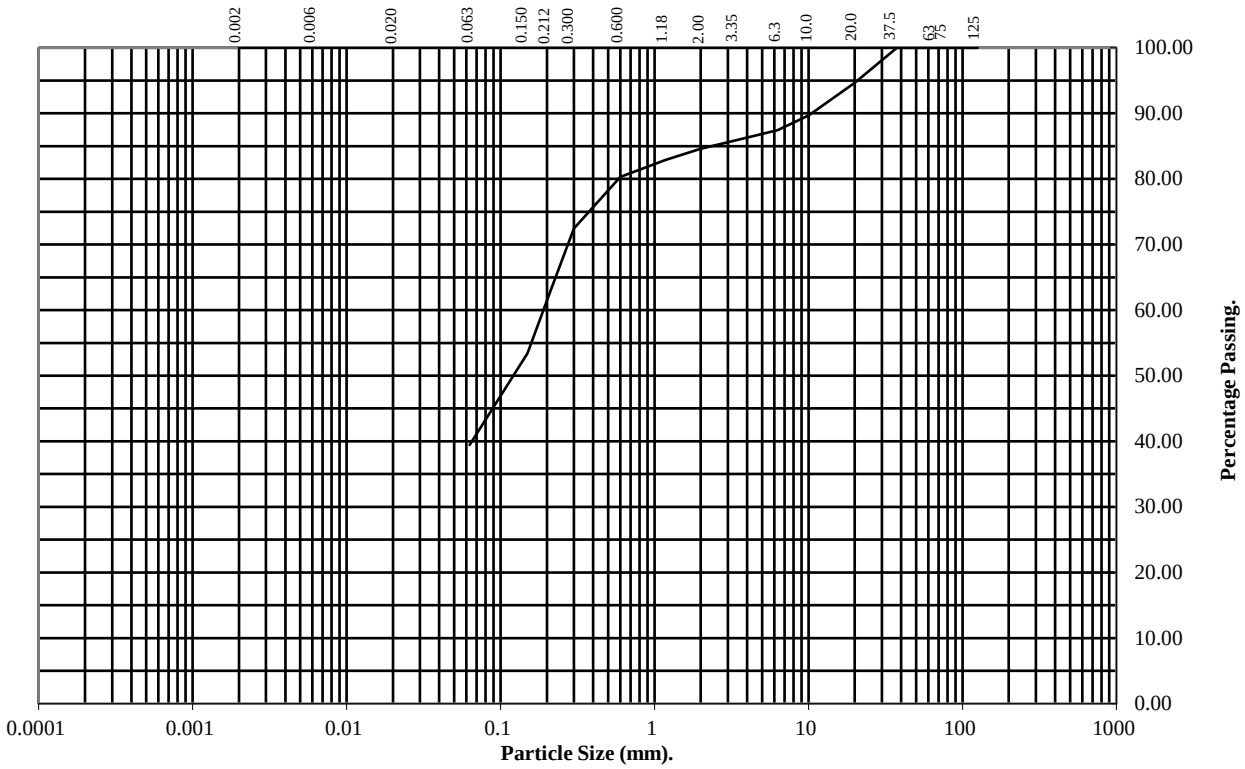
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **Area D-3** **Top Depth (m):**

Sample Number: **3** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	90
6.3	87
3.35	86
2	85
1.18	83
0.6	80
0.3	72
0.212	63
0.15	53
0.063	39

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	46
Silt/Clay	39

Remarks:

See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Stopes Road

Contract No: **PSL23/4203**

Client Ref: **808**

APPENDIX D

Rolling Dynamic Compaction

Former Tarmac Works, Stopes Road, Little Lever, Bolton, BL3 1 NP

RDC compaction and compaction measurement with Polygon roller BW 226 on ground improvement project stopes road, Bolton, UK from 18th – 20th of July 2022

Final conclusions and proposal for the most appropriate compaction method

prepared by Hans Kloubert, Compaction and Continuous Compaction Consultant
who visited jobsite from 18th to 20th of July 2022

The colored areas (1, 2a,2b, 3 and 4) shown in the drawing below (Fig.1) with approx. 25,000 m² Made Ground of a former industrial site of the Tarmac and concrete block paving industry are to be re-compacted with the 26 t polygon roller model BOMAG BW 226 DI . The former fillings consist partly of fine black partly silty sand and in other places of sand mixed with coarse-grained stones and remains of concrete paving material. According to pre-investigations the fillings are 2 - 3 m thick. The ground of the fillings is also called Made Ground.

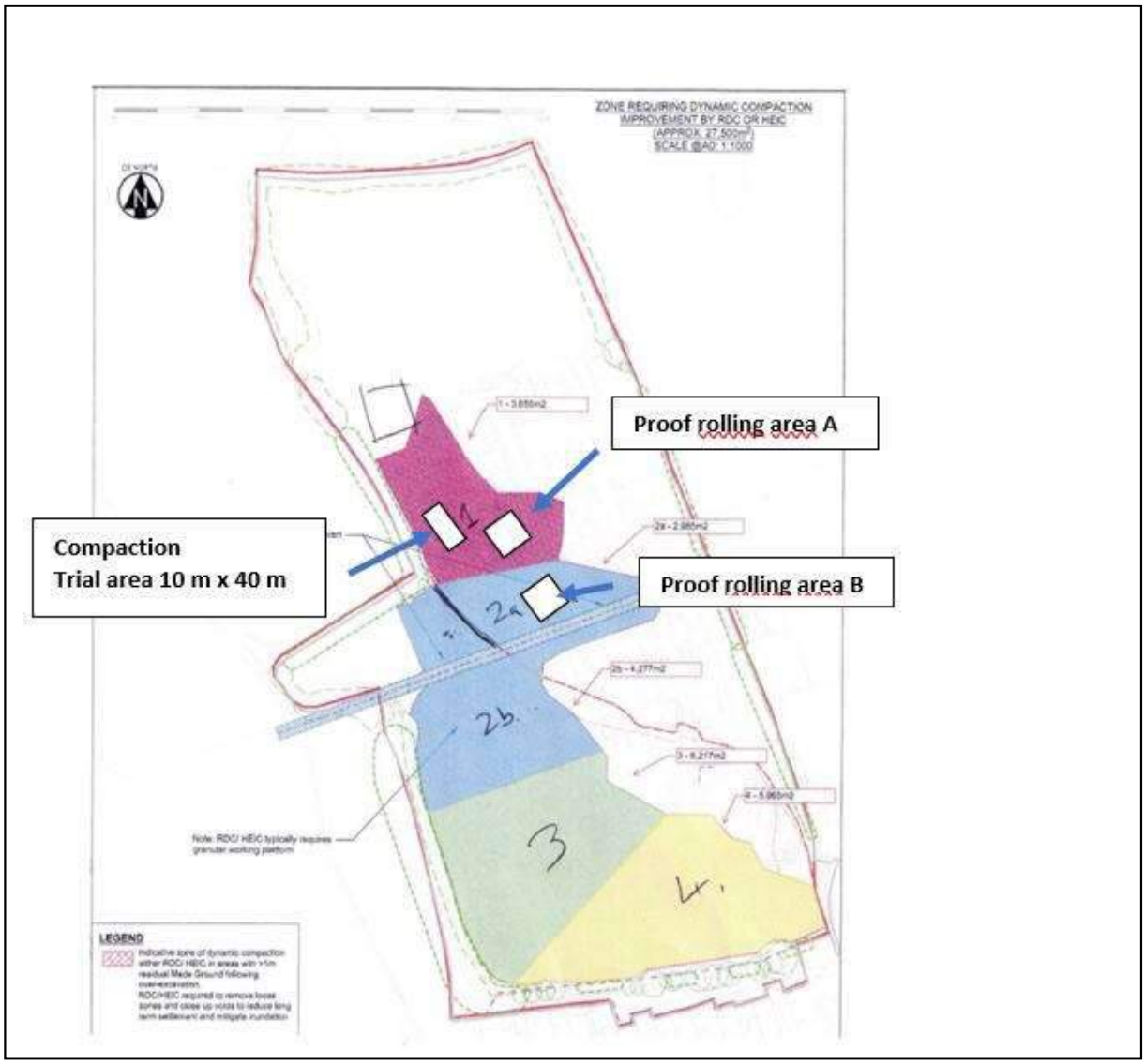


Fig 1. RDC ground improvement area 1, 2a, 2b, 3 and 4i

The polygon roller is equipped with a continuously measuring Evib compaction measuring system (MN/m²) and the BCM documentation system with GPS, which enables 100 % area measurement, recording of compaction quality and stiffness information and as well as mapping of roller passes done .The BCM05 software offers QA/QC engineers extensive possibilities for data analysis and evaluation:

1.Documentation of increase in compaction,
2.analysis of weak spots and uniformity of stiffness of soil layers and grounds
3. maximum achievable compaction
4. Documentation of compaction works done
5. Correlations between roller compaction measurement value (Evib) and plate test parameters
6. Correlations between roller compaction measurement values (Evib) and density in case of granular soils and mixed soils with a constant moisture content.

Fig 2. BW 226 Polygon roller and CCC compaction measurement and documentation system

The method of using a roller-integrated measurement and documentation system is referred to as continuous comparison control (CCC) and specified as CEN TS 17006 , published in December 2016 published by European Committee for Standardization

First compaction trials and proof rolling tests have been carried out on 18th of July:

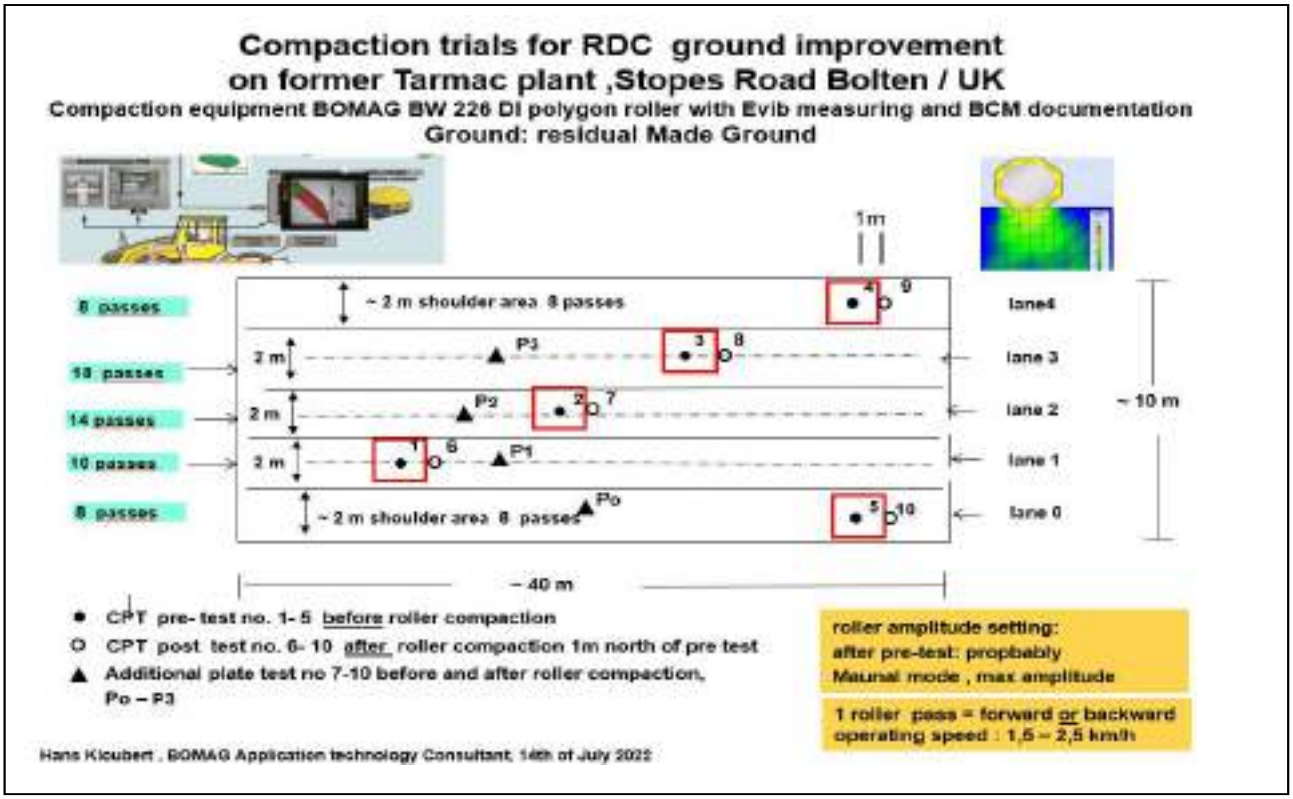


Fig 2. Compaction trial layout

Compaction measure values Evib results after compaction passes with BW 226 :
The coloured Evib map for the 10 x 40 m trial area show values Evib < 20 MN/m² as red,
Evib > 70 as blue colour and four different shades of green Evib levels in between .

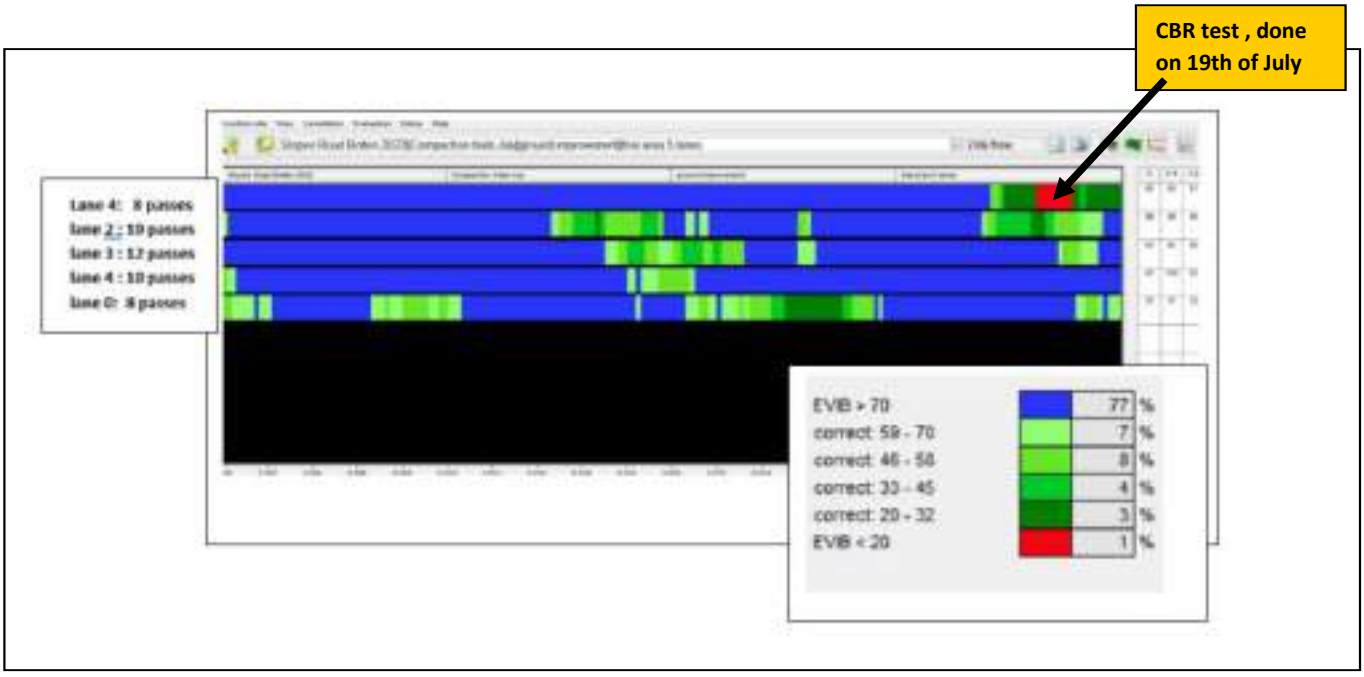


Fig 3. Compaction trial section showing Evib values after compaction,
see number of passes mentioned for each lane left side of illustration

Conclusion:

1. The roller compaction process definitely increases the Evib values from around 10 – 40 (MN/m²) to a level of 60 MN/m² and above.

2. The red zone area , showing lowest Evib values (<20 MN/m²) representing lowest stiffness of the trial area . On 19th July, VHE carried out a Plate bearing test at this location retuning an equivalent CBR value of 3.9%.

3. There was an increase in Evib values after each pass until around pass nr 9 – 11, when values decreased slightly at which point we would conclude that no more compaction and roller measurement value (Evib) increase is possible.

4. It can happen that a decrease in Evib values can happen after two or three passes, but after further passes the measured values (Evib) start to improve again. This is due to a stiff crust on the ground surface that needs to be broken up to allow the compaction energy to transmit deeper into the soil.

5. Compared to other sections of the RDC ground improvement area, rolled after the trial pad, the test pad area has shown that the existing stiffness / strength and bearing capacity is high and quite consistent.

6. The results show that the optimum number of passes for RCD ground improvement project looks to be 10 – 12 passes at maximum amplitude (2.5mm / s)

Further Trial areas

In order to gain further knowledge and conclusions into the Made Ground, its stiffness and compaction potential, two additional test areas were compacted with the polygon equipment and analyzed using the EVIB measurement and documentation system

1. Proof rolling area A 1 pass , done on 18th of July

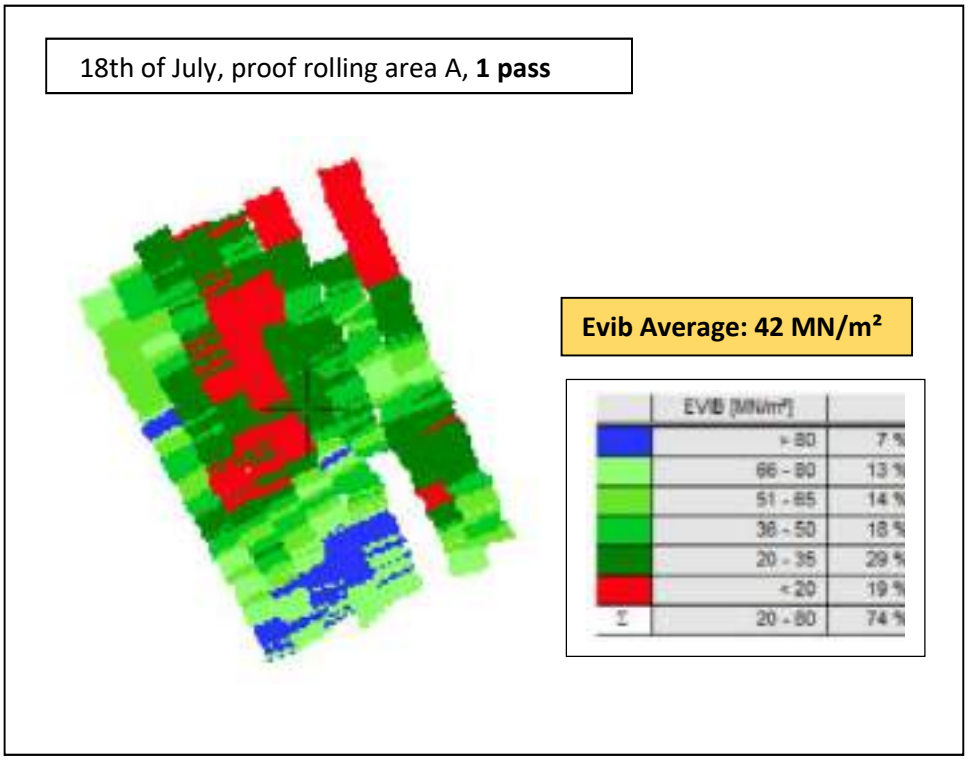


Fig 4. Proof rolling area A , Evib values after 1 pass

The reason for red zones (low Evib values / low stiffness) , when doing a first measuring pass (proof rolling) usually are :

- Non-compacted fine grained, silty and cohesive soils, ashes and peat,
- High moisture contents of mixed, fine grained and cohesive soils, or accumulations of water in lower layers .

The depth location of weak zone can be either the upper ground (100 – 500 mm), which is physically broken up by the roller drum polygonal shape during rolling; or the deeper layers (1000 – 3000 mm), and the zone of influence of the compaction is dependant on the Amplitude setting of the vibrating drum.

2. **Proof rolling area B , 4 passes , done on 18th of July –** similar materials and close location to Area A

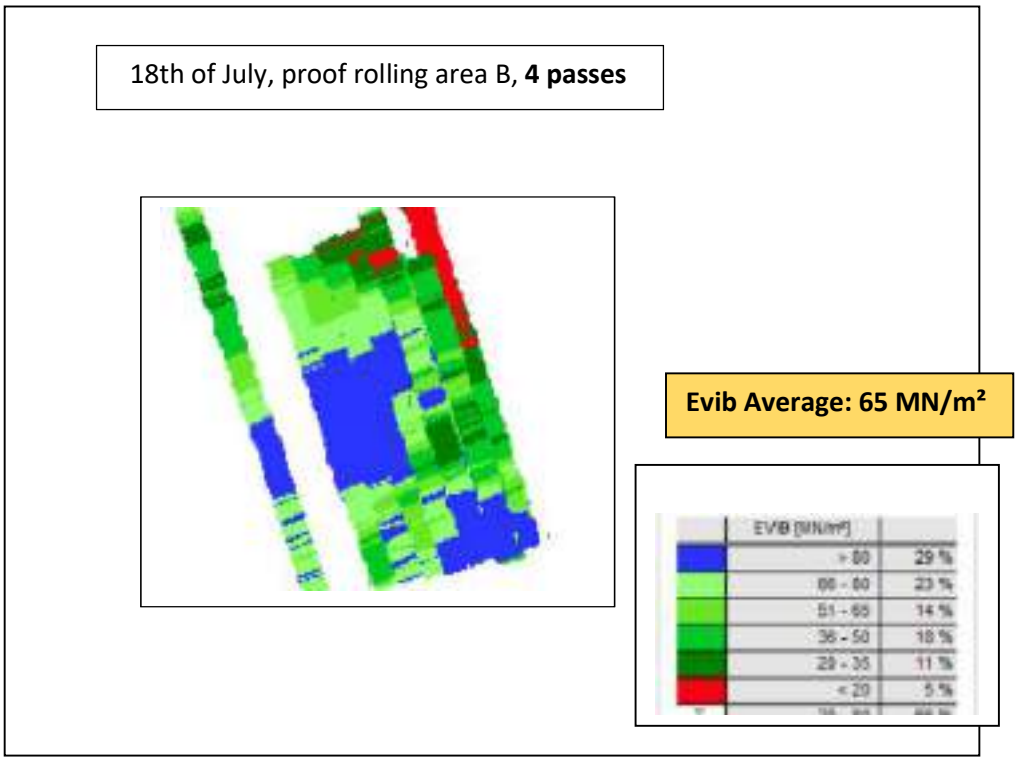


Fig. 5 Fig 4. Proof rolling area B , Evib values after 4 pass

Conclusions:

1. Proof roll in Area A (1 pass) shows strongly varying measured value (Evib) distribution The Average value is 42 MN/m²
2. After another 3 passes (Area B), we see a more homogeneous measurement value distribution in proof rolling Area B and a **mean increase in values by 50%.** The average value is 62 MN/m²
3. The weak zones represented by red color (Evib <20 MN/m^2) equate to less than 5% of the trial pad area

Ground improvement and Evib measurement of 1 and 2 a area on 20th of July

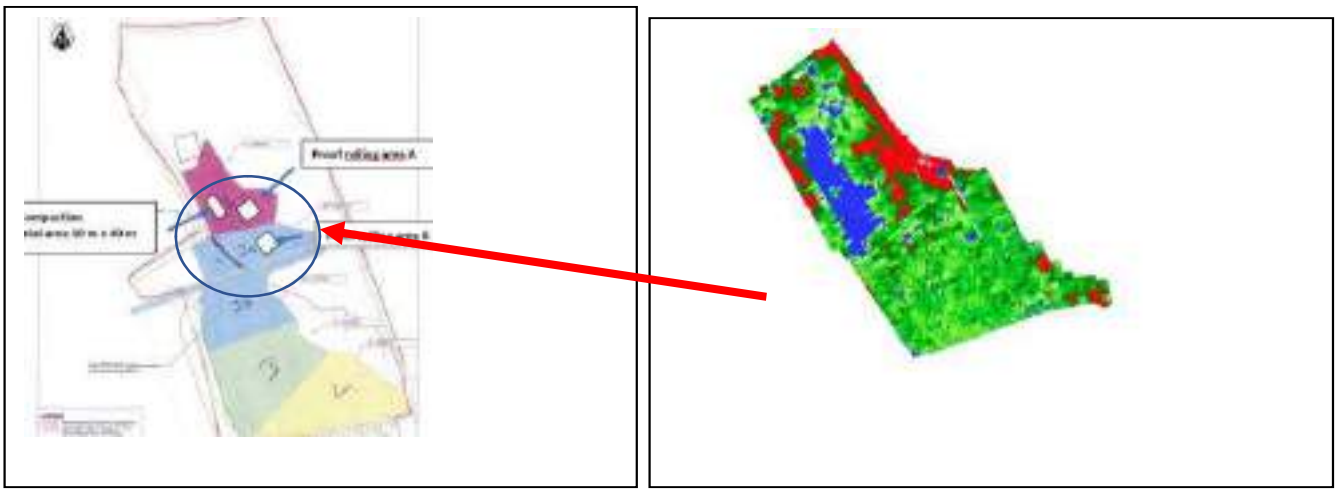


Fig. 6 ground improvement area 1 & 2a , compaction and Evib measurement

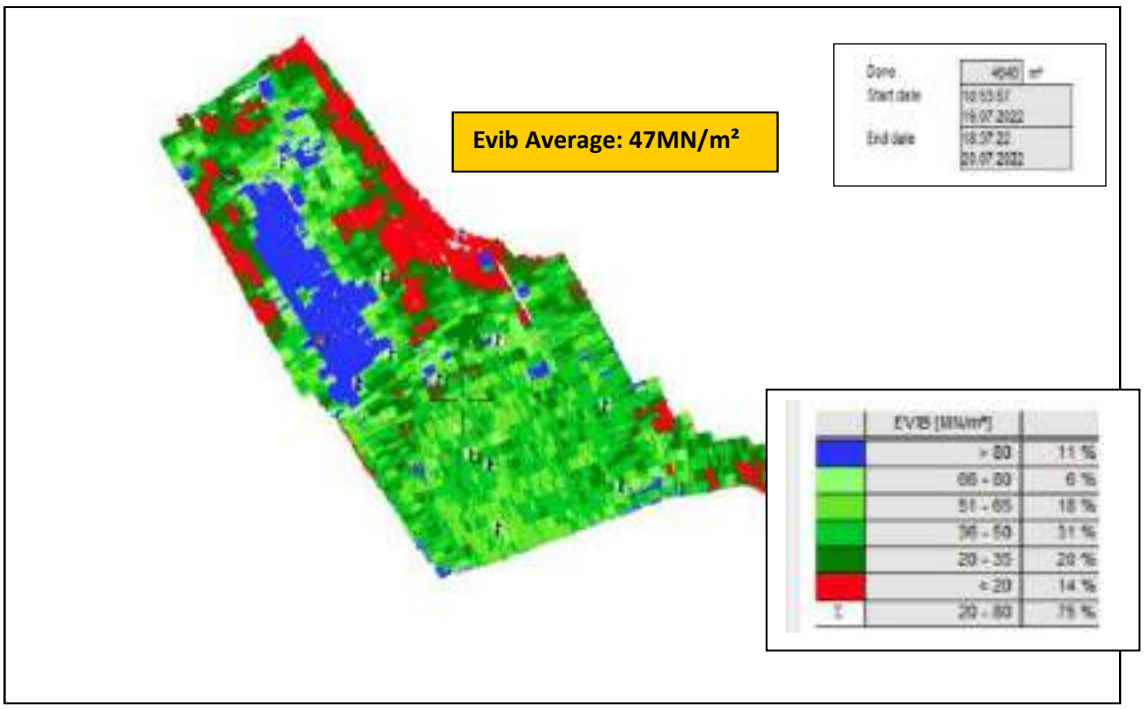


Fig. 7 Evib values / stiffnes situation of area 1 & 2a

The blue zone in Figure 7 above, shows very high Evib values with numbers higher than 80 MN/m² , This is because of a sandy stony ground material with a certain percentage of crushed concrete and building material.

The red zones could not be improved significantly because of water in lower layers, which were pumped upwards during compaction process. Consequently the experienced roller operator limited the number of passes to 10 passes, not 12

Compaction method statement for RDC ground improvement with CCC equipped polygon roller.

Based on the compaction on-site testing and proof rolling measurements conducted on July 18, 19 and 20 the following compaction method is suggested:

1. **Dynamic Compaction** of the entire area with the polygon roller BW 226 DI with **10 passes .**

2. **Roller integrated compaction measurement and documentation system**
The on-board computer Evib measurement and BCM system will be used to observe and record compaction increase or decrease, to identify weak spots (soft spots) and the uniformity or non-uniformity of ground stiffness and potentially to reduce the number of plate bearing tests .

3**. Roller parameter settings**

From the on-site testing and experienced operatives knowledge, it is believed the best compaction methodology would be to reduce the amplitude of the roller after the initial passes, to target varying zones of influence with the dynamic compaction system

Vibration amplitude:
The first 6 passes should be operated with maximum amplitude (manual mode - position 6 – 2.5mm)), in order to get the compaction energy as deep as possible into the ground (2-4m).

The next two passes should be carried out at decreased amplitude (manual mode, position 4 – 1.1mm) to best impact the 1m to 2m depths of fill.

The final 2 passes will be carried out at a further reduced amplitude (position 3 of manual mode – 0.7mm), which will target the upper 0 to 1m layers.

Frequency:
Frequency is always set at 26 – 28 Hz - there is no reason and also no possibility to change

Operating speed:
For mixed soil, cohesive soils, rock stone granular soil mix, optimum compaction results are achieved at 1.5 – 2 km/h

For sandy gravelly soils, speeds need to be increased slightly to better maintain steady rolling with the drum – speeds at 2.0 - 3.0 km/h allow the roller to maintain regular movements without pushing the sands out in front of the drum

4. **Roller pass definition**
One pass means either one forward **or** one reverse pass.

5**. Too many passes** may result in over-compacting and loosening problems of the upper ground zone.

6. Roller Amplitude Settings to target different zones of influence

As long as the Evib values continue to increase during the compaction process, the roller amplitude is set to manual mode position 6.

In the case of Evib values decreasing, which may be caused by over-compaction and soil surface loosening effects, especially with fine-grained black sand and ash materials, or caused by pumping effects of water in deeper soil layer, the operator must decrease the amplitude to position 4, 3 or 2 of the manual mode. The operator can manage the on-board computer screens to get real-time feedback of the ground effects, and adjust the amplitudes accordingly.

7. Evib range of compaction

Throughout the testing programme, **the minimum level of acceptable Evib values is set to 20 MN/m², ** which correlate to more than **3.9% CBR**. Evib values lower than 20 MN/m² are detailed on the CCC printouts as RED ZONES, as will be used within the works as the acceptable way of proof rolling the formation to highlight any soft spots.

The contract works at Stopes Road have detailed a lower limit of **2.5% CBR** to signify a soft spot, so we would set our lower **RED ZONE Evib limit at <15 MN/m²**

All red zones detailed on the CCC outputs for Final Passes will be treated as soft spots in accordance with the AWP Earthworks Specification 10.5.7 and 12.8.1 (as per Hydrock's Earthworks Design items 6.1 (p28) and Appendix 6.3 – Item 5.7(p3))

Backfilling of all soft spots will be carried out with engineered fills in accordance with Item 5.8.6, after any cohesive soils at the sub-formation have been tested with a hand held shear vane and stiffness values recorded (MPa) for the base and each face of the excavation.

The upper level setting for the Evib measurement, **BLUE ZONE** will be set at **>50 MN/m²**

The marginal levels between the red and blue zones will be graded **Green zones, whereby a 15% CBR is equated to an Evib value of 36 MN/m²** which is a standard target level for highways construction in the UK**.**

Further Plate bearing tests will be carried out and equated directly to recorded Evib values at the exact same location, to get a full understanding of the CBR : Evib correlation for the soils on site at Stopes Road, as there is currently only 2 results where these two parameters can be directly compared (3.9% CBR : 20 MN/m² Evib and 110 MN/m2 Evib% : 66% CBR).

8. Surface degradation by the polygon roller

As detailed above, due to the irregular shape of the roller drum, the 0-200mm surface of the compacted soils is unavoidably broken up by the roller.

Prior to any formation plate bearing tests or soils being placed in backfill, the RDC treated formation will be flat-rolled by the BW219 smooth drum roller, to re-compact the upper 200-300mm layer, as per the End-Product compaction specification (6 passes as per the VHE compaction design).

9. GPS measurement of compactor location

Prior to and post DRC compaction works, a detailed level survey will be carried out by VHE to determine any settlement that has occurred as a result of the dynamic compaction.

The BW226 roller is fitted with a GPS system which accurately records the location of the roller within the compaction area. These data records can be assessed to detail the exact number of passes the roller has made in each area of the site and can be analysed to show how many passes at varying amplitudes the roller has carried out, which in turn can highlight improvements in Evib values at any point in time.

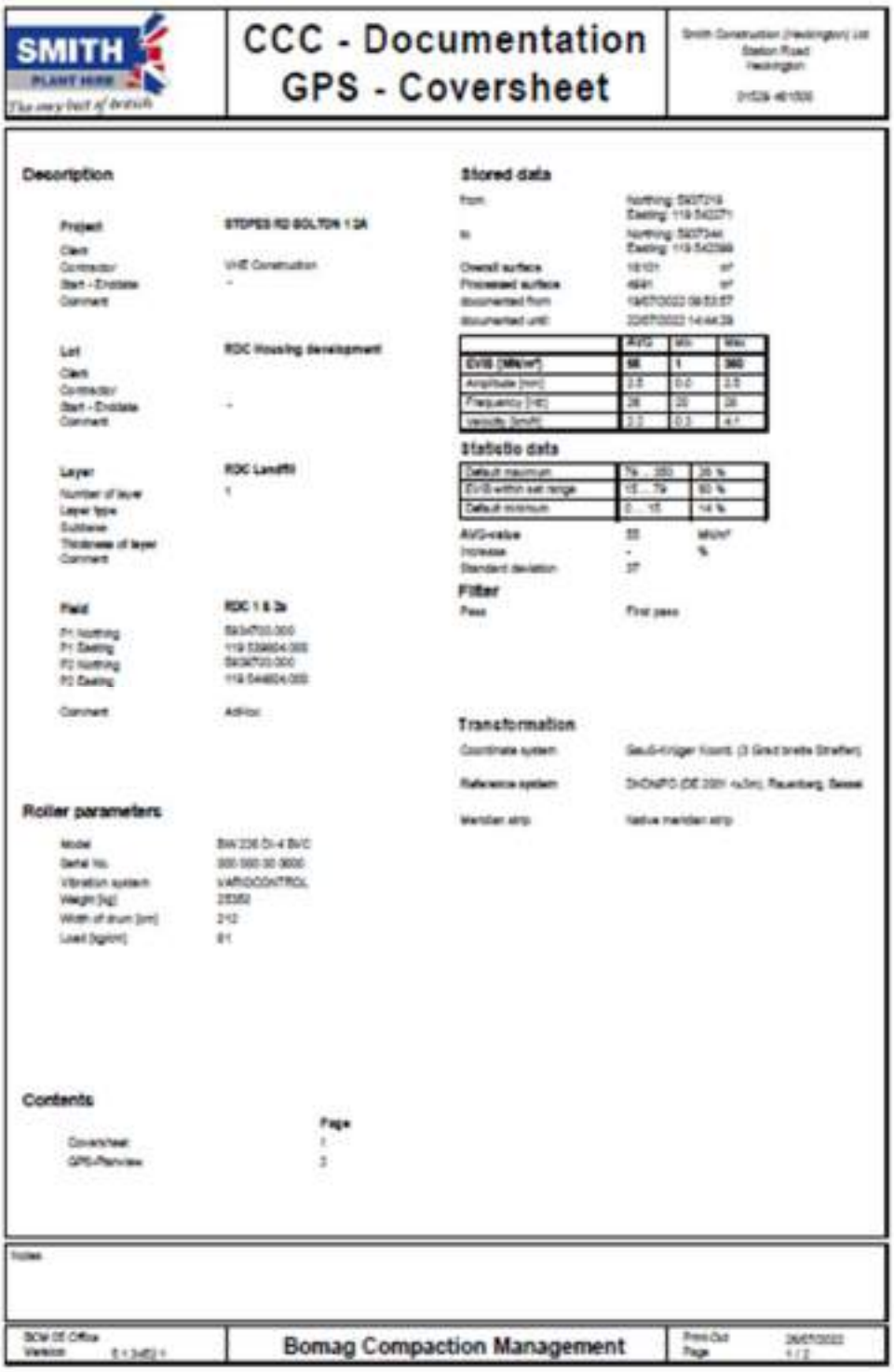
Should no improvement be evident after the initial 6 passes, ie already all **blue** or high **green** Evib values, then the number of passes will be reduced from 10 as no further improvement is possible.

Hans Kloubert
Compaction and CCC Consultant,
BOMAG Application Technology Consultant ,

Office for Civil Engineering
Bruchstr. 30
52090 Aachen / Germany

Appendix A

First and last pass comparisons with Red at 15 MN / m^2 against Blue at 80 Mn/m^2



SMITH PLANT HIRE
The very best of British

CCC - Documentation
GPS - Coversheet

Smith Construction (Heckington) Ltd
Station Road
Heckington
01529 461500

Description

Project	STOPES RD BOLTON 1 2A
Client	
Contractor	VHE Construction
Start - Enddate	-
Comment	
Lot	RDC Housing development
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	RDC Landfill
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	RDC 1 & 2a
P1 Northing	5934700.000
P1 Easting	119 539604.000
P2 Northing	5934700.000
P2 Easting	119 544604.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	000 000 00 0000
Vibration system	VARIOCONTROL
Weight [kg]	25352
Width of drum [cm]	212
Load [kg/cm]	81

Contents

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Coversheet	1
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Stored data

from	Northing: 5937219 Easting: 119 542271
to	Northing: 5937344 Easting: 119 542399
Overall surface	16101 m²
Processed surface	4991 m²
documented from	19/07/2022 09:53:57
documented until	22/07/2022 14:44:39

	AVG	Min	Max
EVIS [MN/m²]	55	1	360
Amplitude [mm]	2.5	0.0	2.5
Frequency [Hz]	28	20	28
Velocity [km/h]	2.2	0.3	4.1

Statistic data

Default maximum	76 ... 350	26 %
EVIS within set range	15 ... 79	60 %
Default minimum	0 ... 15	14 %

AVG-value	55	MN/m²
Increase	-	%
Standard deviation	37	

Filter

Pass	First pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDNPO (DE 2001 +x3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

Notes

BCM DE Office
Version E 1.3+E2.1

Bomag Compaction Management

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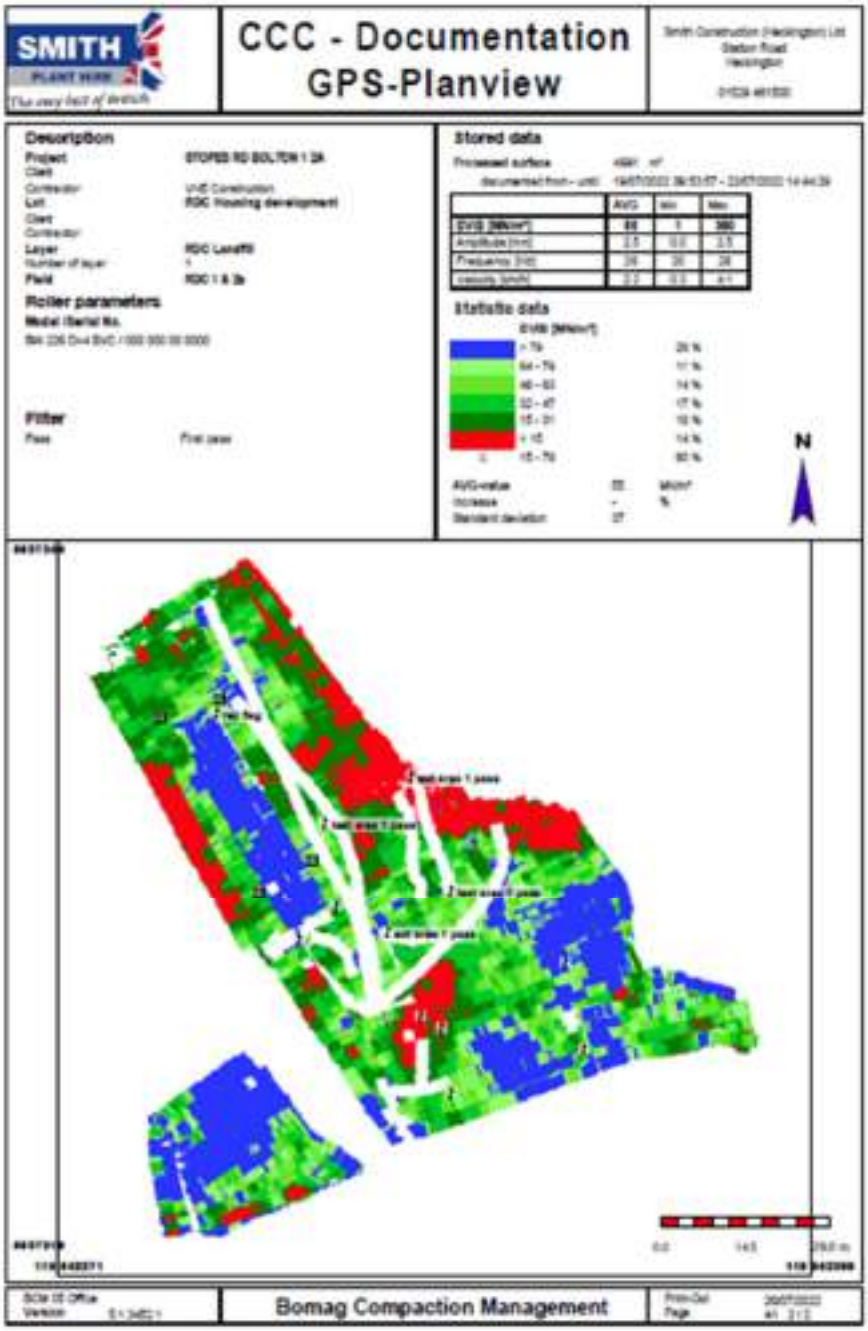
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CCC - Documentation
GPS-Planview
Description
Stored data
Statistic data
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Bomag Compaction Management

SMITH PLANT HIRE
The very best of British

CCC - Documentation
GPS - Coversheet

Smith Construction (Heckington) Ltd
Station Road
Heckington
01529 461500

Description

Project	STOPES RD BOLTON 1 2A
Client	
Contractor	VHE Construction
Start - Enddate	-
Comment	
Lot	RDC Housing development
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	RDC Landfill
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	RDC 1 & 2a
P1 Northing	5934700.000
P1 Easting	119 539604.000
P2 Northing	5939700.000
P2 Easting	119 544604.000
Comment	Adhoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	000 000 00 0000
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	213
Load [kg/cm]	81

Contents

	Page
Coversheet	1
GPS-Planview	2

Stored data

from	Northing: 5937219 Easting: 119 542271
to	Northing: 5937344 Easting: 119 542399
Overall surface	16101 m²
Processed surface	5644 m²
documented from	19/07/2022 09:53:57
documented until	22/07/2022 14:44:30

	AVG	Min	Max
EVIS [MN/m²]	62	1	360
Amplitude [mm]	1.2	0.0	2.5
Frequency [Hz]	28	16	29
Velocity [km/h]	2.4	0.3	3.0

Statistic data

Default maximum	79 ... 360	23 %
EVIS within set range	15 ... 79	75 %
Default minimum	0 ... 15	2 %

AVG-value	62	MN/m²
Increase	14	%
Standard deviation	33	

Filter

Pass	Last pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 rs3m), Rauenberg, Sassel
Meridian strip	Native meridian strip

Notes

SCM DE Office
Version 5.1.3452.1

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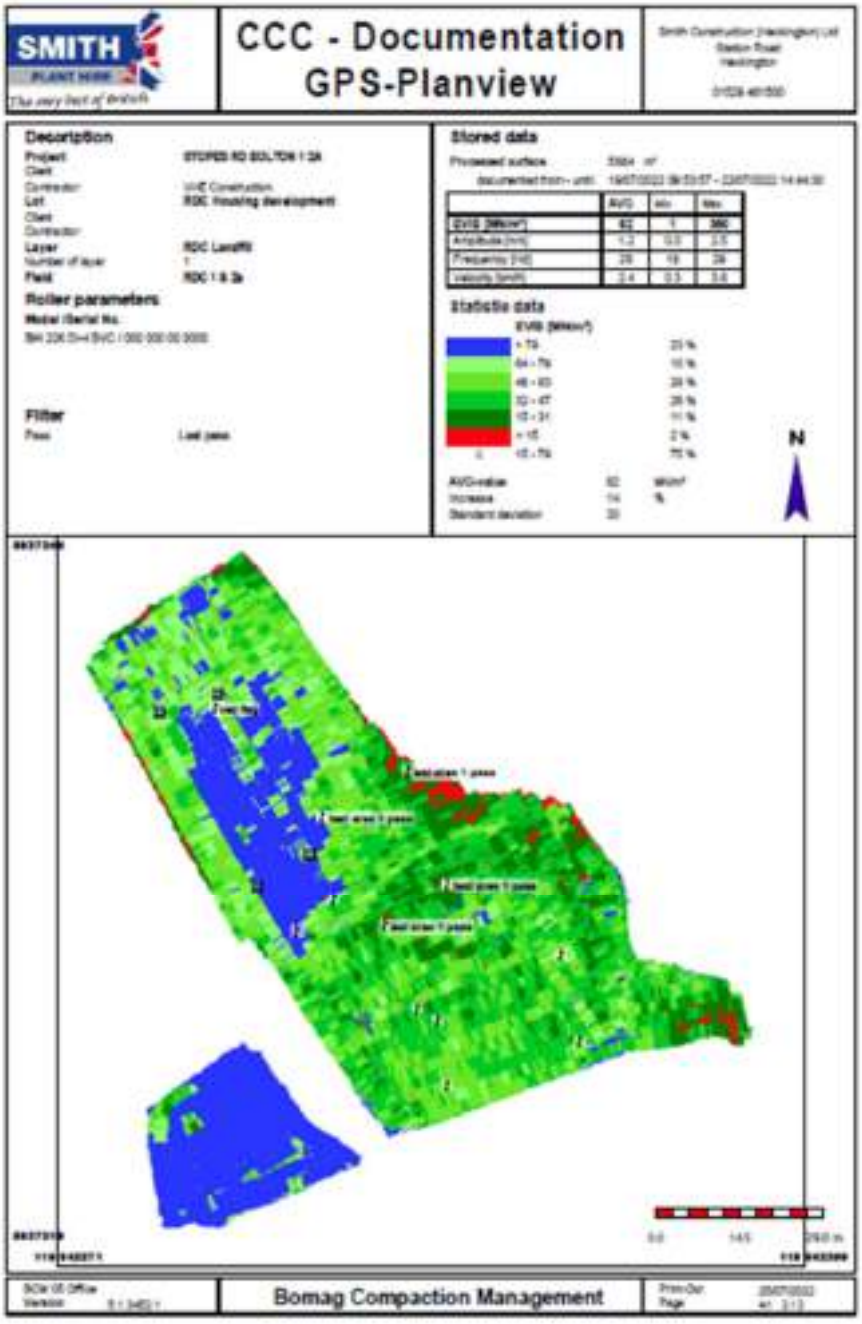
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CCC - Documentation
GPS-Planview
Description
Stored data
Statistic data
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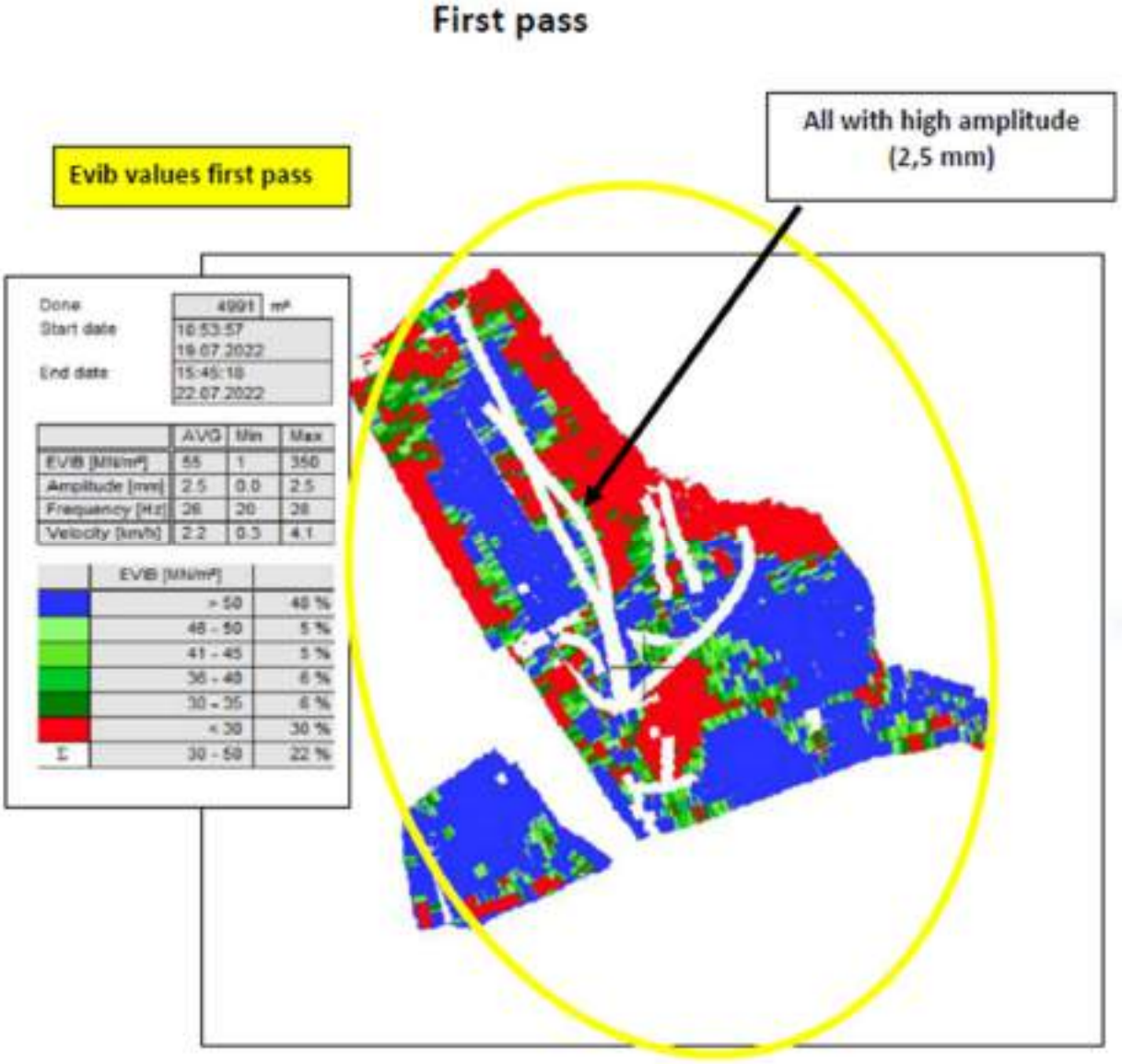
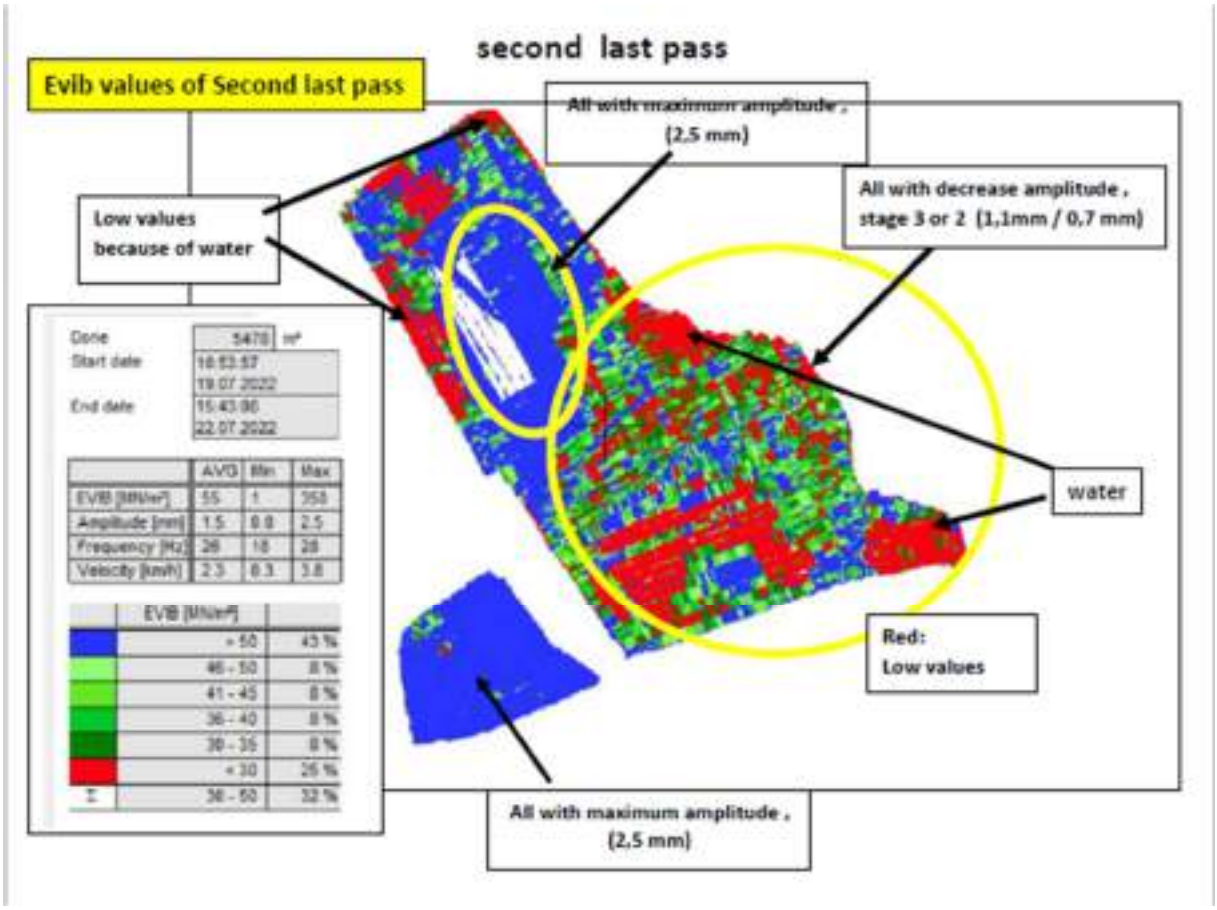
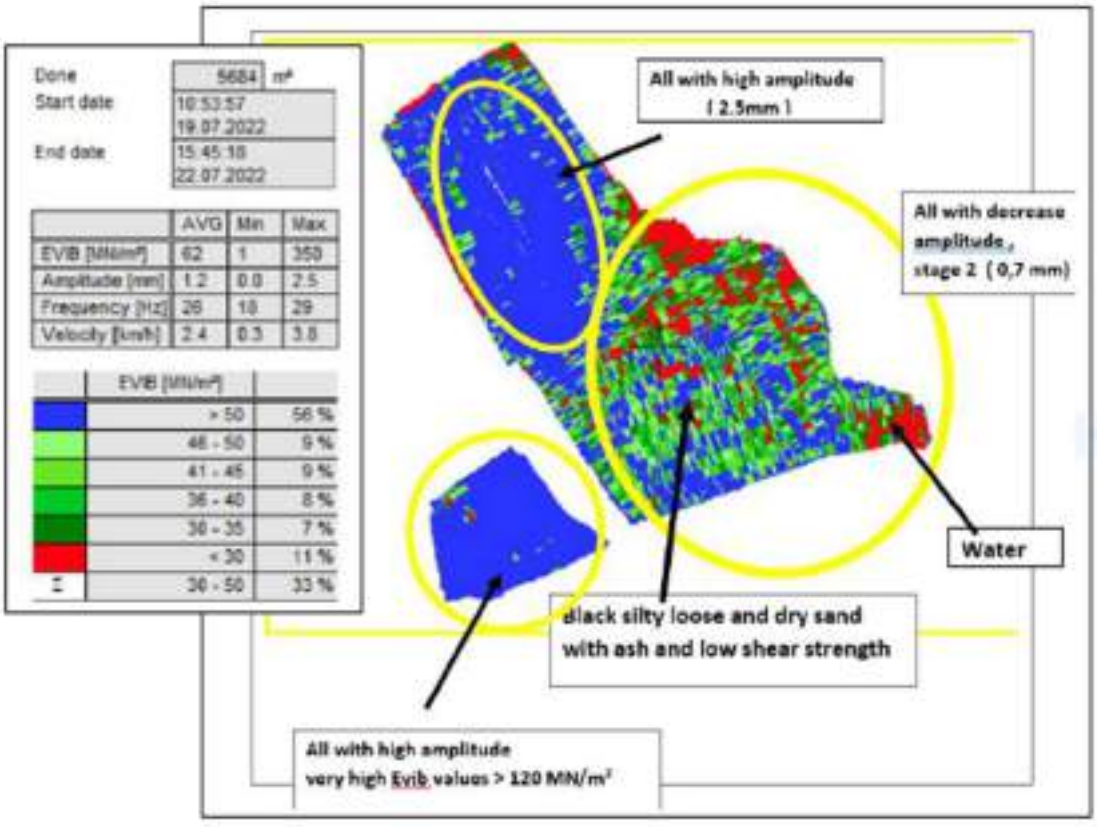
Bomag Compaction Management

Appendix B

First, previous (2nd last pass) and last pass comparisons with Red at 30 MN/m^2 against Blue at 50 Mn/m^2







Last Pass – 30-50 KN/m2 – with lowest amplitude (0.7)

CCC - Documentation GPS - Coversheet

Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 1 2A**
Client	
Contractor	VHE Construction
Start - Enddate	-
Comment	
Lot	**RDC Housing development**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC 1 & 2a**
P1 Northing	5934700.000
P1 Easting	119 539804.000
P2 Northing	5939700.000
P2 Easting	119 544804.000
Comment	AdHoc

Stored data

from	Northing: 5937219 Easting: 119 542271	
to	Northing: 5937344 Easting: 119 542399	
Overall surface	16101	m²
Processed surface	5003	m²
docomented from	19/07/2022 09:53:57	
documented until	03/08/2022 15:02:32	

	AVG	Min	Max
EVIB [MN/m²]	**55**	**1**	**350**
Amplitude [mm]	2.5	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.2	0.3	4.1

Statistic data

Default maximum	49 ... 350	49 %
EVIB within set range	20 ... 49	32 %
Default minimum	0 ... 20	19 %

AVG-value	55	MN/m²
Increase	-	%
Standard deviation	37	

Filter

Pass	First pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

Roller parameters

Model	BW 226 DI-4 BVC	BW 226 DI-4 BVC
Serial No.	000 000 00 0000	101 585 01 1023
Vibration system	VARIOCONTROL	VARIOCONTROL
Weight [kg]	25350	25350
Width of drum [cm]	212	212
Load [kg/cm]	81	81

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CCC - Documentation GPS-Planview

Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 1 2A**
Client	
Contractor	VHE Construction
Lot	**RDC Housing development**
Client	
Contractor	
Layer	**RDC Landfill**
Number of layer	1
Field	**RDC 1 & 2a**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 000 000 00 0000
BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass First pass

Stored data

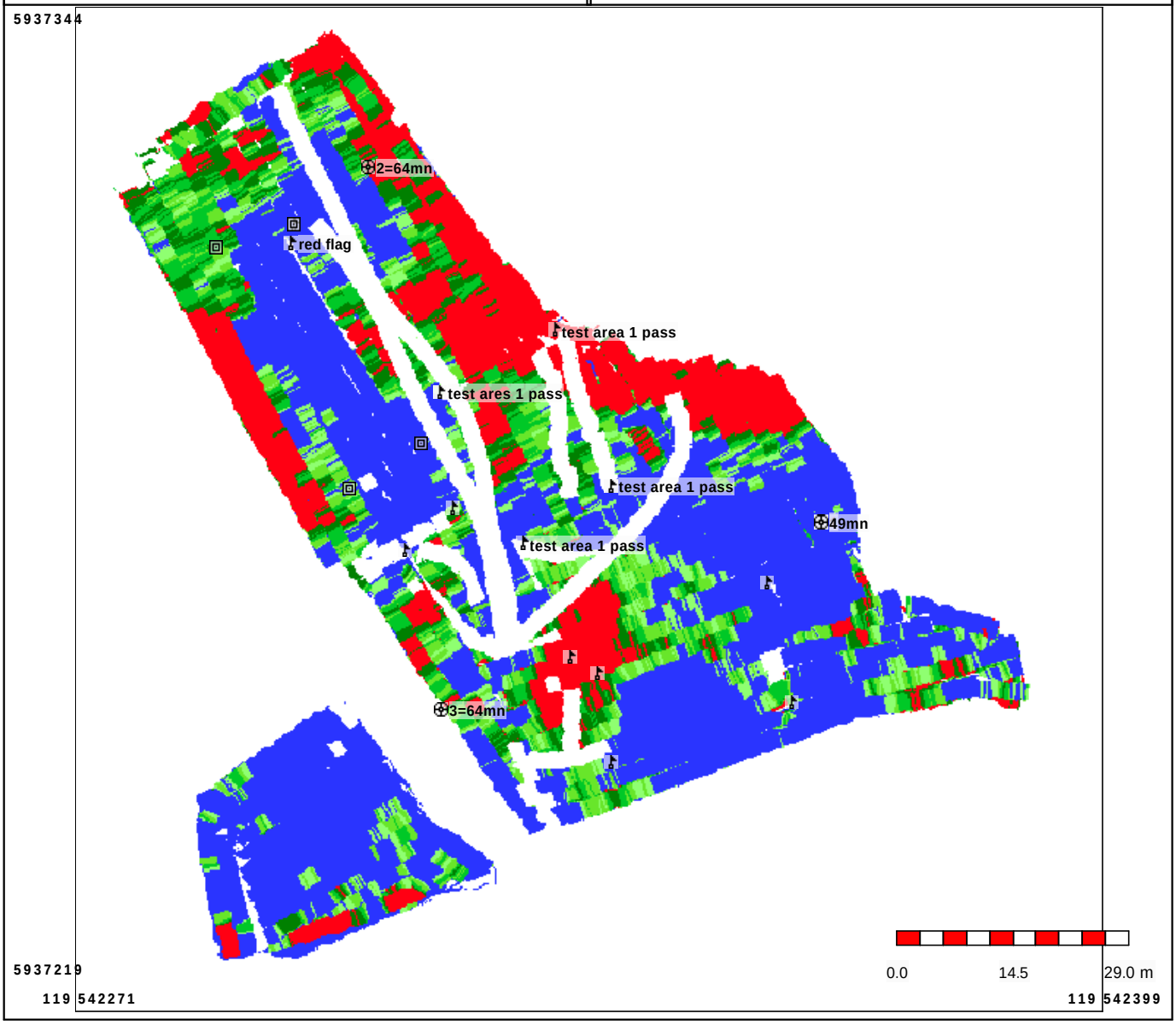
Processed surface 5003 m²
documented from - until 19/07/2022 09:53:57 - 03/08/2022 15:02:32

	AVG	Min	Max
EVIB [MN/m²]	**55**	**1**	**350**
Amplitude [mm]	2.5	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.2	0.3	4.1

Statistic data

EVIB [MN/m²]	
> 49	49 %
43 - 49	7 %
36 - 42	8 %
28 - 35	9 %
20 - 27	8 %
< 20	19 %
Σ 20 - 49	32 %

AVG-value	55	MN/m²
Increase	-	%
Standard deviation	37	



CCC - Documentation GPS - Coversheet

Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 1 2A**
Client	
Contractor	VHE Construction
Start - Enddate	-
Comment	
Lot	**RDC Housing development**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC 1 & 2a**
P1 Northing	5934700.000
P1 Easting	119 539804.000
P2 Northing	5939700.000
P2 Easting	119 544804.000
Comment	AdHoc

Stored data

from	Northing: 5937219 Easting: 119 542271	
to	Northing: 5937344 Easting: 119 542399	
Overall surface	16101	m²
Processed surface	5707	m²
docomented from	19/07/2022 09:53:57	
documented until	03/08/2022 16:02:49	

	AVG	Min	Max
EVIB [MN/m²]	**60**	**1**	**350**
Amplitude [mm]	1.1	0.0	2.5
Frequency [Hz]	26	18	31
Velocity [km/h]	2.5	0.3	3.8

Statistic data

Default maximum	49 ... 350	57 %
EVIB within set range	20 ... 49	39 %
Default minimum	0 ... 20	4 %

AVG-value	60	MN/m²
Increase	13	%
Standard deviation	30	

Filter

Pass	Last pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

Roller parameters

Model	BW 226 DI-4 BVC	BW 226 DI-4 BVC
Serial No.	000 000 00 0000	101 585 01 1023
Vibration system	VARIOCONTROL	VARIOCONTROL
Weight [kg]	25350	25350
Width of drum [cm]	212	212
Load [kg/cm]	81	81

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CCC - Documentation GPS-Planview

Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 1 2A**
Client	
Contractor	VHE Construction
Lot	**RDC Housing development**
Client	
Contractor	
Layer	**RDC Landfill**
Number of layer	1
Field	**RDC 1 & 2a**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 000 000 00 0000
BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass Last pass

Stored data

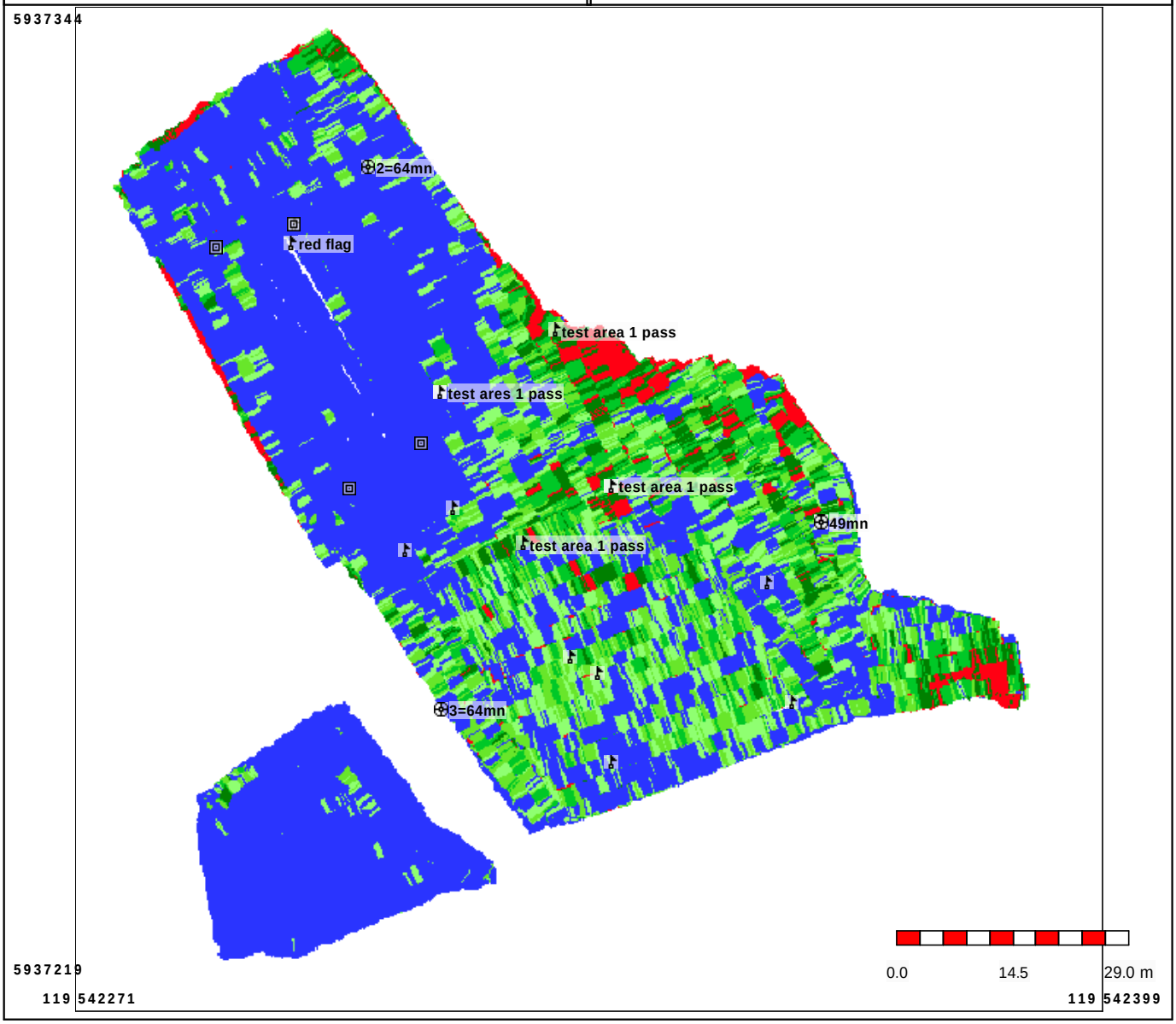
Processed surface 5707 m²
documented from - until 19/07/2022 09:53:57 - 03/08/2022 16:02:49

	AVG	Min	Max
EVIB [MN/m²]	**60**	**1**	**350**
Amplitude [mm]	1.1	0.0	2.5
Frequency [Hz]	26	18	31
Velocity [km/h]	2.5	0.3	3.8

Statistic data

EVIB [MN/m²]	
> 49	57 %
43 - 49	13 %
36 - 42	12 %
28 - 35	9 %
20 - 27	5 %
< 20	4 %
Σ 20 - 49	39 %

AVG-value	60	MN/m²
Increase	13	%
Standard deviation	30	



CCC - Documentation GPS - Coversheet

Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 2B**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev 2B**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 2B**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC 2B**
P1 Northing	5934600.000
P1 Easting	119 539804.000
P2 Northing	5939600.000
P2 Easting	119 544804.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937157 Easting: 119 542289	
to	Northing: 5937250 Easting: 119 542400	
Overall surface	10323	m²
Processed surface	3194	m²
docomented from	02/08/2022 11:49:37	
documented until	12/08/2022 13:32:53	

	AVG	Min	Max
EVIB [MN/m²]	**38**	**1**	**295**
Amplitude [mm]	2.4	0.0	2.5
Frequency [Hz]	26	20	28
Velocity [km/h]	1.6	0.3	4.4

Statistic data

Default maximum	49 ... 350	25 %
EVIB within set range	20 ... 49	36 %
Default minimum	0 ... 20	39 %

AVG-value	38	MN/m²
Increase	-	%
Standard deviation	35	

Filter

Pass	First pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Smith Construction (Heckington) Ltd
Station Road
Heckington

01529 461500

Description

Project	**STOPES RD BOLTON 2B**
Client	
Contractor	
Lot	**RDC Housing Dev 2B**
Client	
Contractor	
Layer	**RDC Landfill 2B**
Number of layer	1
Field	**RDC 2B**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass First pass

Stored data

Processed surface 3194 m²

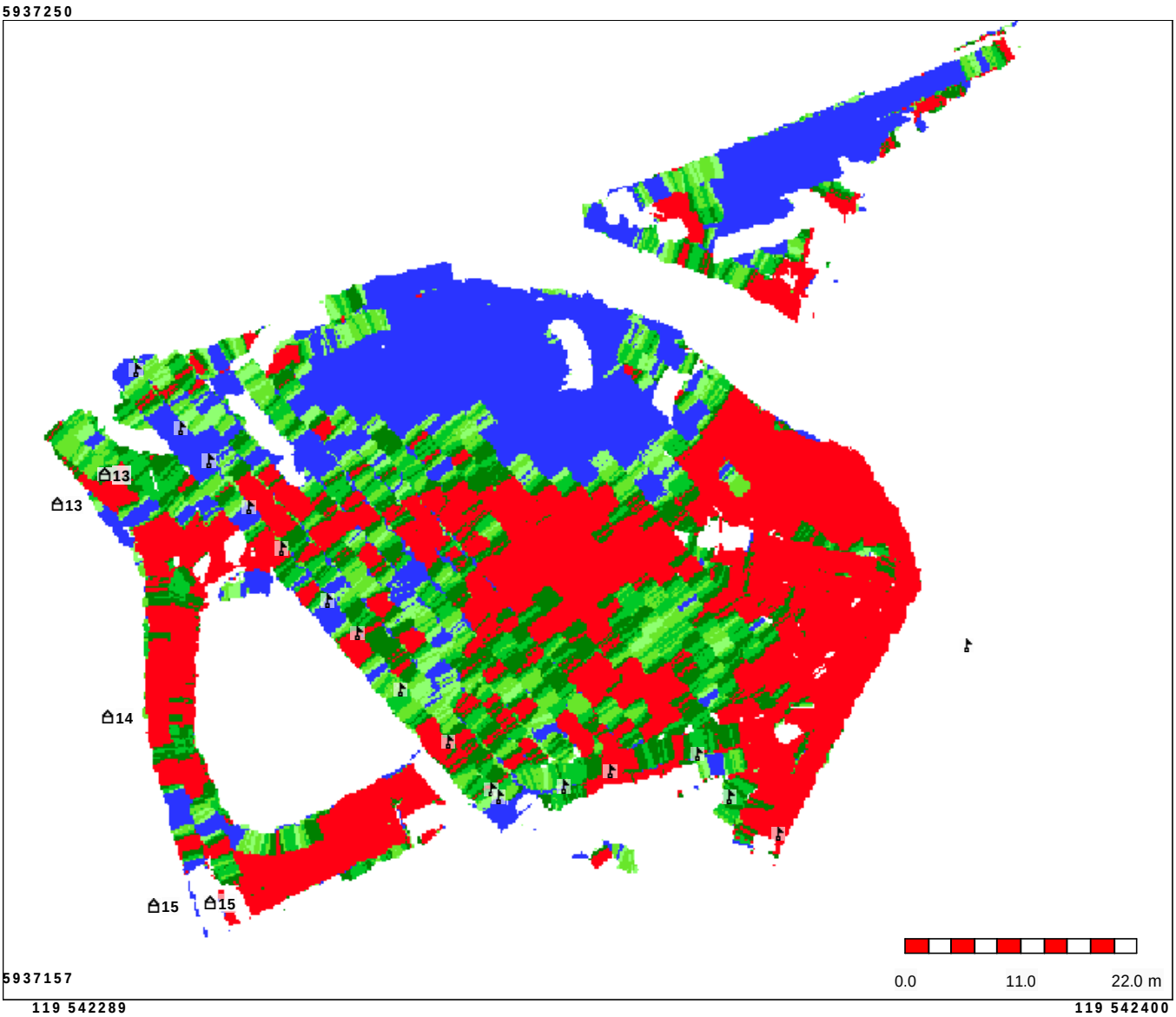
documented from - until 02/08/2022 11:49:37 - 12/08/2022 13:32:53

	AVG	Min	Max
EVIB [MN/m²]	**38**	**1**	**295**
Amplitude [mm]	2.4	0.0	2.5
Frequency [Hz]	26	20	28
Velocity [km/h]	1.6	0.3	4.4

Statistic data

	EVIB [MN/m²]	
	> 49	25 %
	43 - 49	5 %
	36 - 42	8 %
	28 - 35	10 %
	20 - 27	13 %
	< 20	39 %
Σ	20 - 49	36 %

AVG-value	38	MN/m²
Increase	-	%
Standard deviation	35	



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Description

Project	**STOPES RD BOLTON 2B**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev 2B**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 2B**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC 2B**
P1 Northing	5934600.000
P1 Easting	119 539804.000
P2 Northing	5939600.000
P2 Easting	119 544804.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937157 Easting: 119 542289	
to	Northing: 5937250 Easting: 119 542400	
Overall surface	10323	m²
Processed surface	3530	m²
docomented from	02/08/2022 11:49:37	
documented until	12/08/2022 13:33:13	

	AVG	Min	Max
EVIB [MN/m²]	**57**	**1**	**524**
Amplitude [mm]	0.8	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.2	0.3	3.6

Statistic data

Default maximum	49 ... 350	70 %
EVIB within set range	20 ... 49	28 %
Default minimum	0 ... 20	2 %

AVG-value	57	MN/m²
Increase	3	%
Standard deviation	18	

Filter

Pass	Last pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Description

Project	**STOPES RD BOLTON 2B**
Client	
Contractor	
Lot	**RDC Housing Dev 2B**
Client	
Contractor	
Layer	**RDC Landfill 2B**
Number of layer	1
Field	**RDC 2B**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass — Last pass

Stored data

Processed surface 3530 m²

documented from - until 02/08/2022 11:49:37 - 12/08/2022 13:33:13

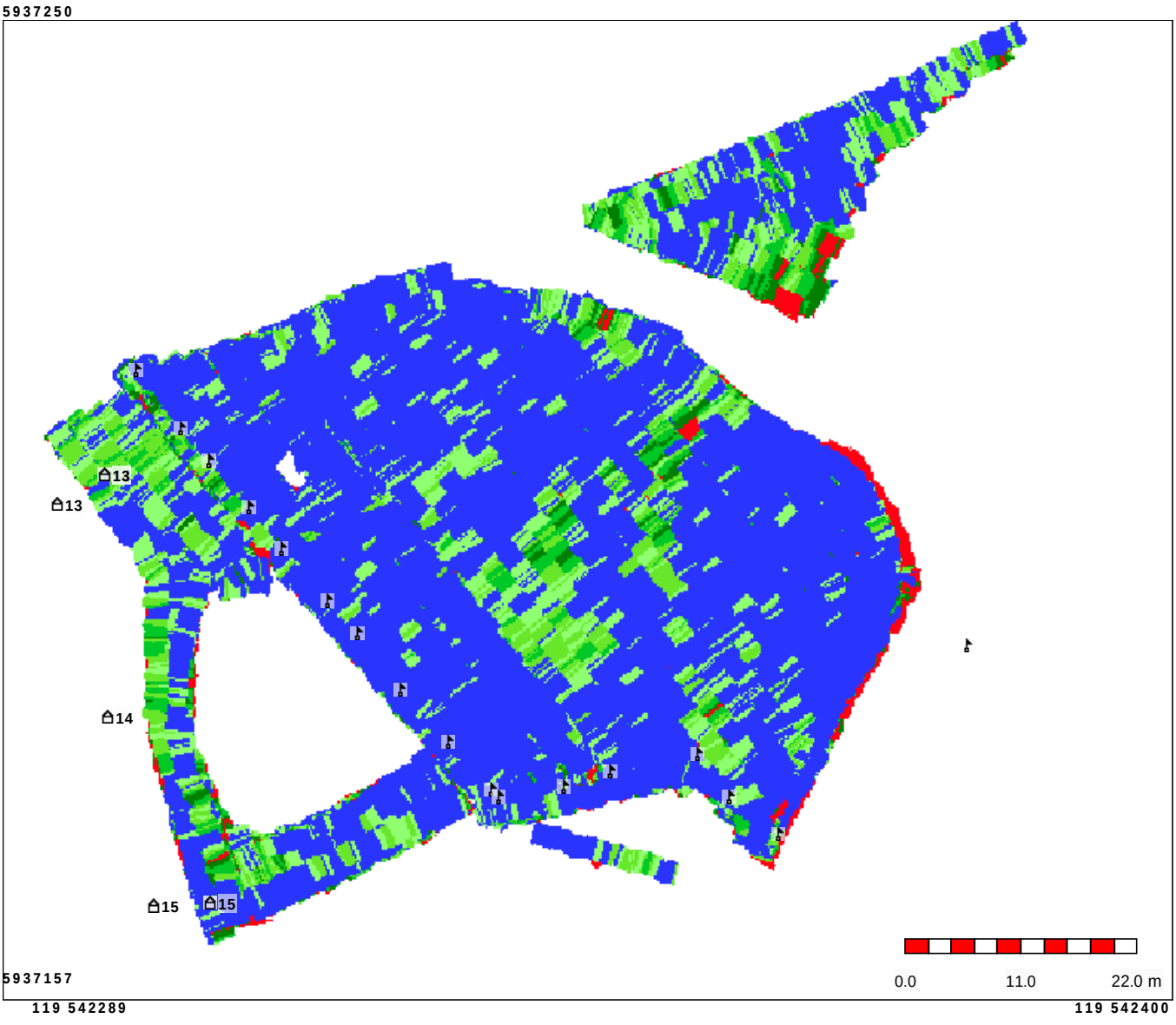
	AVG	Min	Max
EVIB [MN/m²]	**57**	**1**	**524**
Amplitude [mm]	0.8	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.2	0.3	3.6

Statistic data

EVIB [MN/m²]

	> 49	70 %
	43 - 49	14 %
	36 - 42	8 %
	28 - 35	4 %
	20 - 27	2 %
	< 20	2 %
Σ	20 - 49	28 %

AVG-value	57	MN/m²
Increase	3	%
Standard deviation	18	



CCC - Documentation GPS - Coversheet

Smith Construction (Heckington) Ltd
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Description

Project	**STOPES RD BOLTON 3**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev. area 3**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 3**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC Area 3**
P1 Northing	5934600.000
P1 Easting	119 539804.000
P2 Northing	5939600.000
P2 Easting	119 544804.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937083 Easting: 119 542301	
to	Northing: 5937187 Easting: 119 542401	
Overall surface	10482	m²
Processed surface	4288	m²
docomented from	08/08/2022 15:03:32	
documented until	23/08/2022 08:15:19	

	AVG	Min	Max
EVIB [MN/m²]	**14**	**1**	**524**
Amplitude [mm]	2.5	0.0	2.5
Frequency [Hz]	26	20	29
Velocity [km/h]	1.6	0.3	4.0

Statistic data

Default maximum	49 ... 350	4 %
EVIB within set range	20 ... 49	17 %
Default minimum	0 ... 20	79 %

AVG-value	14	MN/m²
Increase	-	%
Standard deviation	18	

Filter

Pass	First pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Description

Project	**STOPES RD BOLTON 3**
Client	
Contractor	
Lot	**RDC Housing Dev. area 3**
Client	
Contractor	
Layer	**RDC Landfill 3**
Number of layer	1
Field	**RDC Area 3**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass First pass

Stored data

Processed surface 4288 m²

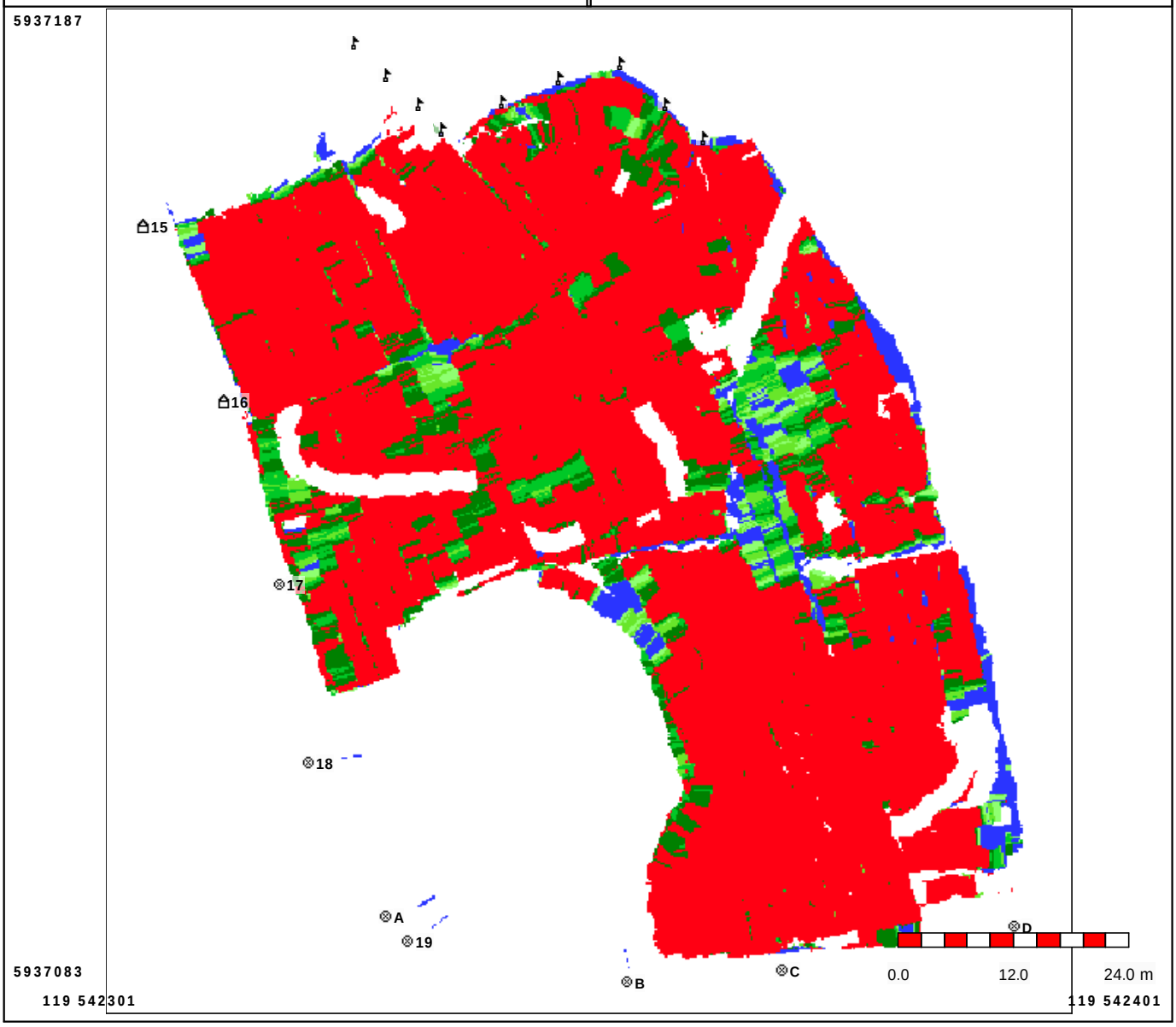
documented from - until 08/08/2022 15:03:32 - 23/08/2022 08:15:19

	AVG	Min	Max
EVIB [MN/m²]	**14**	**1**	**524**
Amplitude [mm]	2.5	0.0	2.5
Frequency [Hz]	26	20	29
Velocity [km/h]	1.6	0.3	4.0

Statistic data

EVIB [MN/m²]	
> 49	4 %
43 - 49	2 %
36 - 42	3 %
28 - 35	4 %
20 - 27	8 %
< 20	79 %
Σ 20 - 49	17 %

AVG-value	14	MN/m²
Increase	-	%
Standard deviation	18	



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Smith Construction (Heckington) Ltd
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Description

Project	**STOPES RD BOLTON 3**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev. area 3**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 3**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC Area 3**
P1 Northing	5934600.000
P1 Easting	119 539804.000
P2 Northing	5939600.000
P2 Easting	119 544804.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937083 Easting: 119 542301	
to	Northing: 5937187 Easting: 119 542401	
Overall surface	10482	m²
Processed surface	4633	m²
docomented from	08/08/2022 15:03:32	
documented until	23/08/2022 09:52:02	

	AVG	Min	Max
EVIB [MN/m²]	**59**	**1**	**350**
Amplitude [mm]	0.8	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.1	0.3	3.8

Statistic data

Default maximum	49 ... 350	74 %
EVIB within set range	20 ... 49	22 %
Default minimum	0 ... 20	4 %

AVG-value	59	MN/m²
Increase	2	%
Standard deviation	19	

Filter

Pass	Last pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Description

Project	**STOPES RD BOLTON 3**
Client	
Contractor	
Lot	**RDC Housing Dev. area 3**
Client	
Contractor	
Layer	**RDC Landfill 3**
Number of layer	1
Field	**RDC Area 3**

Roller parameters

Model /Serial No.

BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass — Last pass

Stored data

Processed surface 4633 m²

documented from - until 08/08/2022 15:03:32 - 23/08/2022 09:52:02

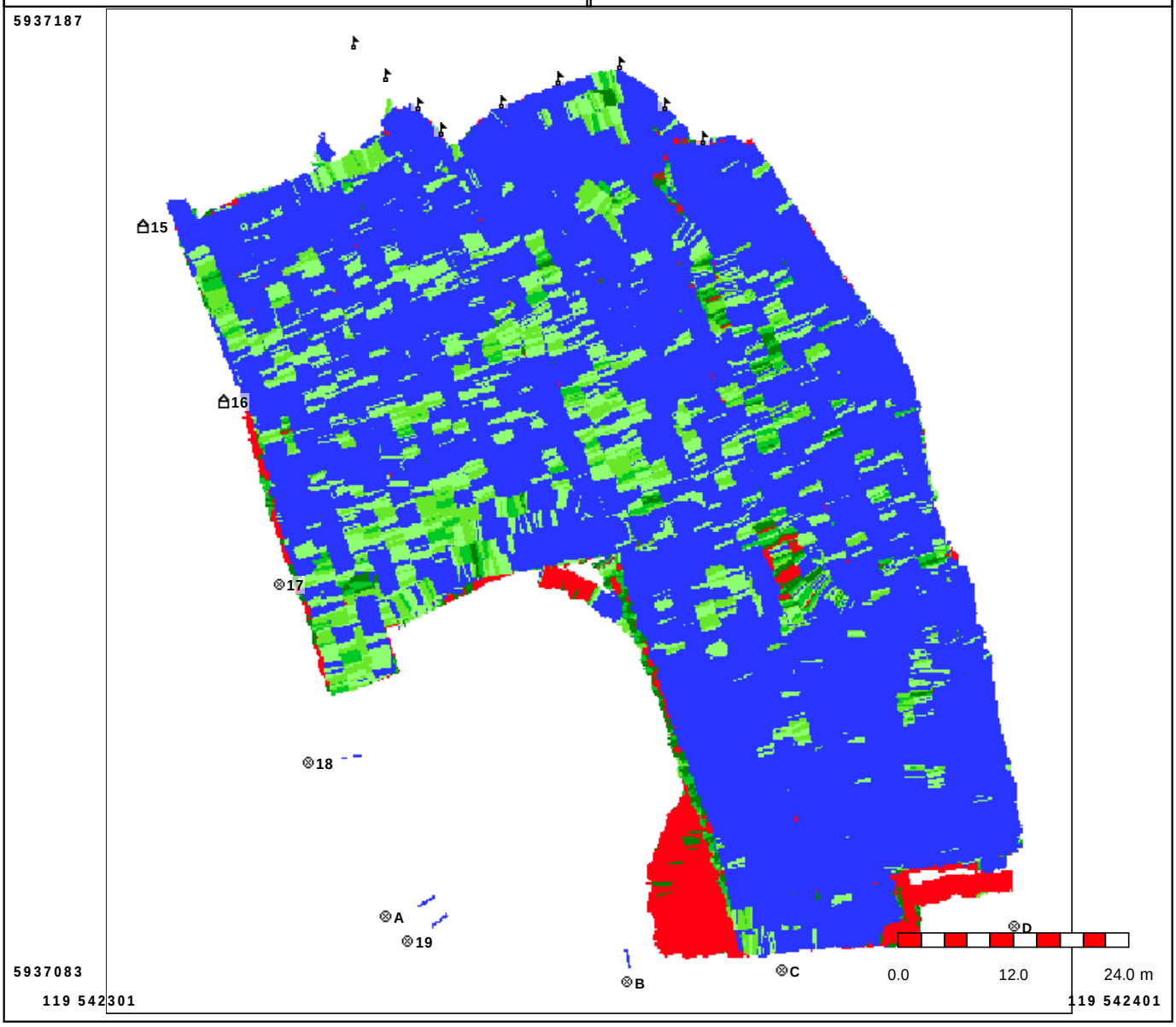
	AVG	Min	Max
EVIB [MN/m²]	**59**	**1**	**350**
Amplitude [mm]	0.8	0.0	2.5
Frequency [Hz]	26	20	30
Velocity [km/h]	2.1	0.3	3.8

Statistic data

EVIB [MN/m²]

	> 49	74 %
	43 - 49	12 %
	36 - 42	6 %
	28 - 35	3 %
	20 - 27	1 %
	< 20	4 %
Σ	20 - 49	22 %

AVG-value	59	MN/m²
Increase	2	%
Standard deviation	19	



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Smith Construction (Heckington) Ltd
Station Road
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Description

Project	**STOPES RD BOLTON 4**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev area4**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 4**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC Area 4**
P1 Northing	5934600.000
P1 Easting	119 539900.000
P2 Northing	5939600.000
P2 Easting	119 544900.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937090 Easting: 119 542431	
to	Northing: 5937128 Easting: 119 542468	
Overall surface	1444	m²
Processed surface	488	m²
docomented from	17/08/2022 16:19:09	
documented until	23/08/2022 12:03:13	

	AVG	Min	Max
EVIB [MN/m²]	**18**	**1**	**200**
Amplitude [mm]	2.4	0.6	2.5
Frequency [Hz]	26	24	27
Velocity [km/h]	1.6	0.3	4.2

Statistic data

Default maximum	49 ... 350	6 %
EVIB within set range	20 ... 49	27 %
Default minimum	0 ... 20	67 %

AVG-value	18	MN/m²
Increase	-	%
Standard deviation	20	

Filter

Pass	First pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Description

Project **STOPES RD BOLTON 4**
Client
Contractor
Lot **RDC Housing Dev area4**
Client
Contractor
Layer **RDC Landfill 4**
Number of layer 1
Field **RDC Area 4**

Roller parameters

Model /Serial No.
BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass First pass

Stored data

Processed surface 488 m²
documented from - until 17/08/2022 16:19:09 - 23/08/2022 12:03:13

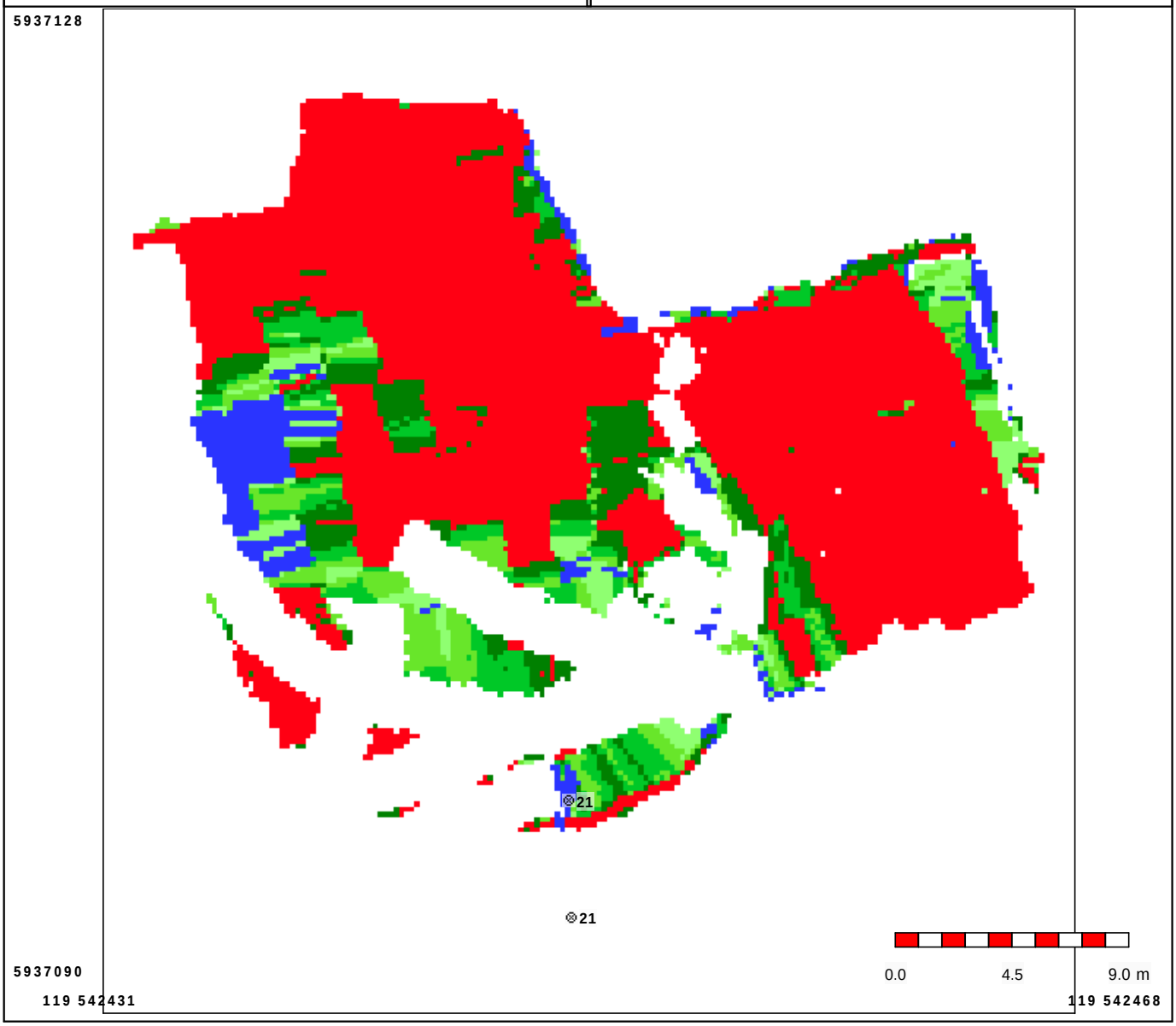
	AVG	Min	Max
EVIB [MN/m²]	**18**	**1**	**200**
Amplitude [mm]	2.4	0.6	2.5
Frequency [Hz]	26	24	27
Velocity [km/h]	1.6	0.3	4.2

Statistic data

EVIB [MN/m²]		
	> 49	6 %
	43 - 49	4 %
	36 - 42	6 %
	28 - 35	7 %
	20 - 27	10 %
	< 20	67 %
Σ	20 - 49	27 %

AVG-value	18	MN/m²
Increase	-	%
Standard deviation	20	

N



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Smith Construction (Heckington) Ltd
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Description

Project	**STOPES RD BOLTON 4**
Client	
Contractor	
Start - Enddate	-
Comment	
Lot	**RDC Housing Dev area4**
Client	
Contractor	
Start - Enddate	-
Comment	
Layer	**RDC Landfill 4**
Number of layer	1
Layer type	
Subbase	
Thickness of layer	
Comment	
Field	**RDC Area 4**
P1 Northing	5934600.000
P1 Easting	119 539900.000
P2 Northing	5939600.000
P2 Easting	119 544900.000
Comment	AdHoc

Roller parameters

Model	BW 226 DI-4 BVC
Serial No.	101 585 01 1023
Vibration system	VARIOCONTROL
Weight [kg]	25350
Width of drum [cm]	212
Load [kg/cm]	81

Stored data

from	Northing: 5937090 Easting: 119 542431	
to	Northing: 5937128 Easting: 119 542468	
Overall surface	1444	m²
Processed surface	655	m²
docomented from	17/08/2022 16:19:09	
documented until	23/08/2022 12:06:35	

	AVG	Min	Max
EVIB [MN/m²]	**59**	**1**	**261**
Amplitude [mm]	0.8	0.3	2.5
Frequency [Hz]	26	22	28
Velocity [km/h]	2.3	0.3	5.7

Statistic data

Default maximum	49 ... 350	73 %
EVIB within set range	20 ... 49	22 %
Default minimum	0 ... 20	5 %

AVG-value	59	MN/m²
Increase	4	%
Standard deviation	20	

Filter

Pass	Last pass

Transformation

Coordinate system	Gauß-Krüger Koord. (3 Grad breite Streifen)
Reference system	DHDN/PD (DE 2001 <±3m), Rauenberg, Bessel
Meridian strip	Native meridian strip

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Description

Project **STOPES RD BOLTON 4**
Client
Contractor
Lot **RDC Housing Dev area4**
Client
Contractor
Layer **RDC Landfill 4**
Number of layer 1
Field **RDC Area 4**

Roller parameters

Model /Serial No.
BW 226 DI-4 BVC / 101 585 01 1023

Filter

Pass Last pass

Stored data

Processed surface 655 m²
documented from - until 17/08/2022 16:19:09 - 23/08/2022 12:06:35

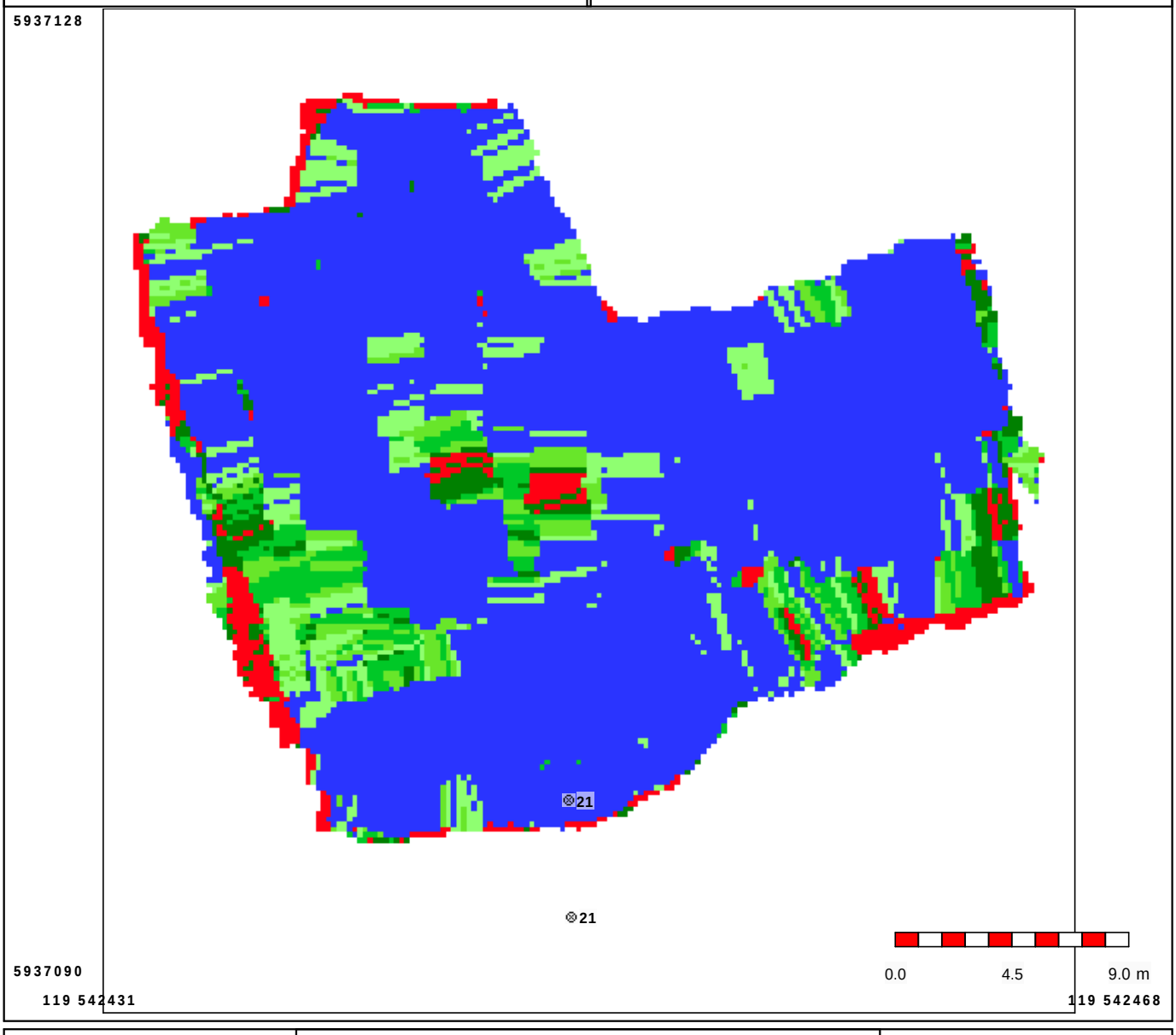
	AVG	Min	Max
EVIB [MN/m²]	**59**	**1**	**261**
Amplitude [mm]	0.8	0.3	2.5
Frequency [Hz]	26	22	28
Velocity [km/h]	2.3	0.3	5.7

Statistic data

EVIB [MN/m²]

	> 49	73 %
	43 - 49	9 %
	36 - 42	5 %
	28 - 35	5 %
	20 - 27	3 %
	< 20	5 %
Σ	20 - 49	22 %

AVG-value 59 MN/m²
Increase 4 %
Standard deviation 20



APPENDIX E

VHE Soft Spot Reports

Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 27.07.22 Witnessed by - R. Hargreaves Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Wednesday 27.07.22**
Position: Area 2a – Grid square F12 and G12 [E - 376282 , N - 407672]	**Time: 3pm**

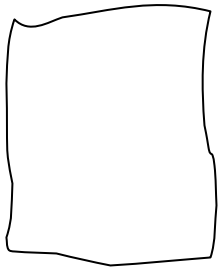
Comments / Details of soft spot: Some groundwater ingress from ashy gravels on top of culvert clay surround immediately to the south of the soft spot – waters ran in when soft spot opened up but stopped after 30 minutes.

Dimensions 5.5m x 8.6m x 0.7m.

Backfilled with site won yellow gravel (Type 1) and Crushed block paving (6F2) and compacted in 250mm layers with 8 passes of roller.

Photo(s) of soft spot

Shear vane records if cohesive soils



N

No clay / cohesive soils at base or sides of excavation, so no shear vanes possible. Soft spot sides / base comprised of made ground 'Black Ashy Fill'

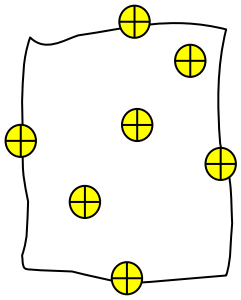
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 28.07.22 Witnessed by - R. Hargreaves Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Thursday 28.07.22**
Position: Area 1 – Grid square F10 [E - 376262 , N - 407701]	**Time: 10am**
Comments / Details of soft spot: Soft spot located within made ground 'Black Ashy Fill'	

Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot : 4 m x 3 m x 0.75 m deep.

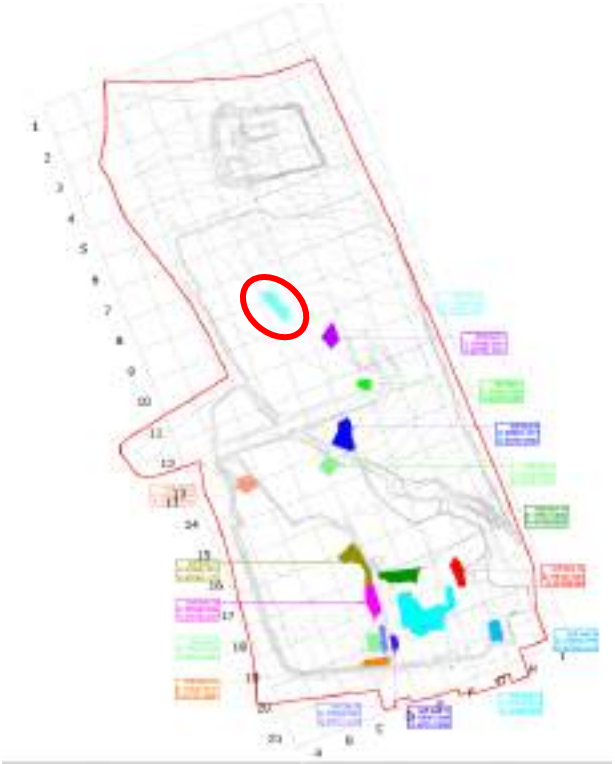
Shear vane results (kPa):

N: 61, E: 72, S: 65, W: 76 – Base results: 49, 61, 55

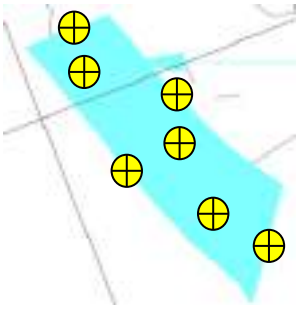
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 28.07.22 Witnessed by - R. Hargreaves Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Thursday 28.07.22**
Position: Area 1 – Grid square E8, E9 [E - 376229, N - 407701]	**Time: 11am**
Comments / Details of soft spot: **Soft Spot within made ground 'Black Ashy Fill'. Excavated to natural clays** **Dimensions – 7.0m x 20.1m x 0.4m**	



Shear vane records if cohesive soils



clay / cohesive soils at base of excavation, tested with hand shear vane – as detailed

Shear vane results (kPa):
N: 62, E: 63, S: 84, W: 97 – Base results: 53, 72, 69

	VHE Construction Plc Safety Procedure	Site/Department:	Stopes Road, Bolton
		Contract No:	C 808
		Site Reference:	Soft Spot : 004 – 14E

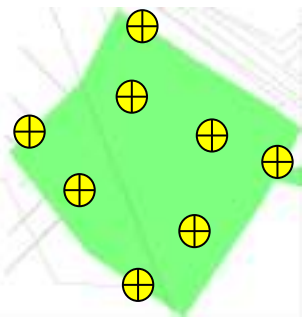
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 04.08.22 Witnessed by - I. Sugden Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Thursday 04.08.22**
Position: Area 1 – Grid square D14, E14 [E - 376264 , N - 407621]	**Time: 10am**
Comments / Details of soft spot: **Soft Spot located within made ground 'Black Ashy Fill'** **Dimensions of Hotspot : 10 m x 11 m x 0.5m.**	

Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Shear vane results (kPa):
N: 80, E: 47, S: 85, W: 52 – Base results: 50, 60, 98, 113.

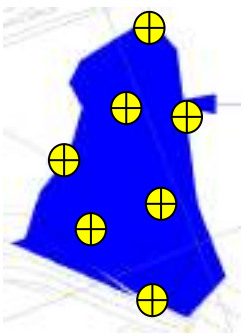
Excavation Inspection Report – Soft Spots at Formation

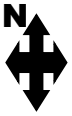
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 09.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Tuesday 09.08.22**
Position: Area 1 – Grid square E13 [E - 376271 , N - 407642]	**Time: 3pm**
Comments / Details of soft spot: **A patch of soft clay was removed from the ground before being filled with type 1 material in layers and rolled before being brought up to the original height of the ground.**	

Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise): 4m, 13m, 11m, 10m x 1m deep.

Shear vane results (kPa):
N: 39, E: 59, S: 63, W: 51 – Base results: 40, 40, 70.

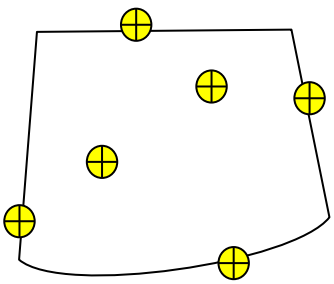
Excavation Inspection Report – Soft Spots at Formation

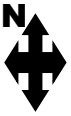
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 09.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Tuesday 09.08.22**
Position: Area 1 – Grid square B13, B14 [E - 376208 , N - 407609]	**Time: 9am**
Comments / Details of soft spot: **A patch of wet material was removed from the ground before being filled with type 1 material in 250mm layers and rolled before being brought up to the original height of the ground.**	

Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise): 10 x 5 x 1m deep.

Shear vane results (kPa):

N: 68, E: 62, S: 112, W: 125 – Base results: 53, 68

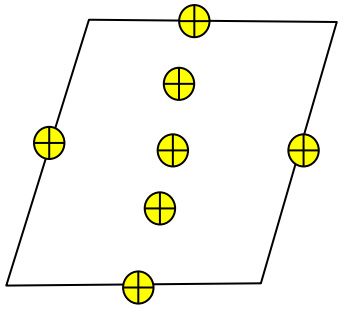
Excavation Inspection Report – Soft Spots at Formation

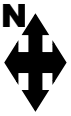
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 16.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Tuesday 16.08.22**
Position: Area 1 – Grid square D19 [E - 376286 , N - 407517]	**Time: 4pm**
Comments / Details of soft spot: **A patch of wet material was removed from the ground before being backfilled with type 1 material in 250mm layers and compacted with 8 passes of the roller.**	

Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise): 7 x 10 x 0.75m deep.

Shear vane results (kPa):

N: 62, E: 45, S: 70, W: 70 – Base results: 49, 46, 54

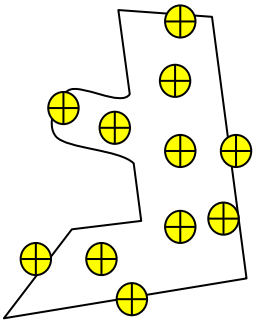
Excavation Inspection Report – Soft Spots at Formation

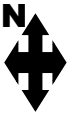
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 17.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Wednesday 17.08.22**
Position: Area 1 – Grid square D19, D20 [E - 376296 , N - 407511]	**Time: 12pm**
Comments / Details of soft spot: **A patch of wet material was removed from the ground, backfilled with type 1 material in 250mm layers and compacted with 8 passes of the roller.**	

Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

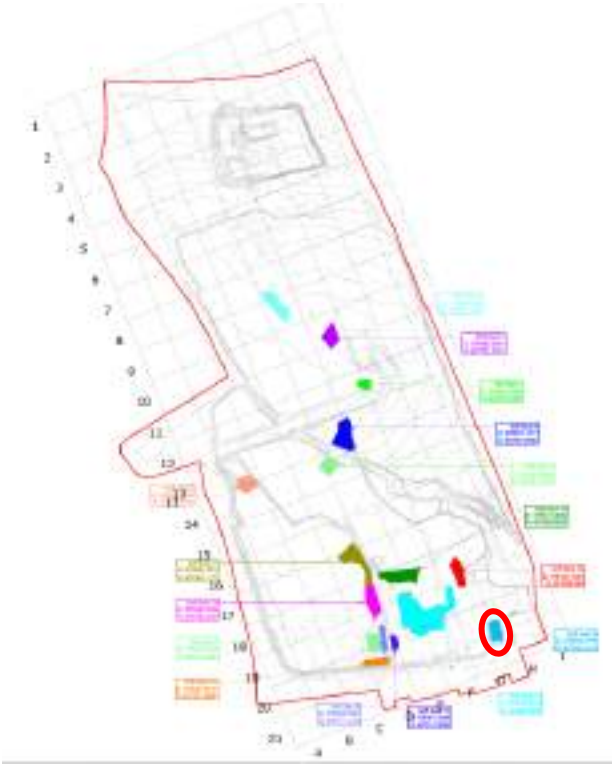
Dimensions of Hotspot (Clockwise): 15 x 4 x 0.5m deep.

Shear vane results (kPa):
N: 61, E: 42, S: 50, W: 70, 47 – Base results: 73, 44, 51, 67, 50.

Excavation Inspection Report – Soft Spots at Formation

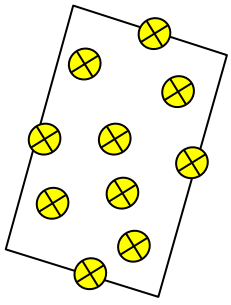
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 18.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

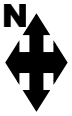
Soft spot remedial works Inspected By: R. Hargreaves	**Date: Thursday 18.08.22**
Position: Area 1 – Grid square G20 [E - 376363 , N - 407520]	**Time: 10am**
Comments / Details of soft spot: **A patch of soft, brown natural clay was removed from the formation ground level before being filled with type 1 material in and rolled in layers.**	



Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise): 6.5 x 12 x 0.5m deep.

Shear vane results (kPa):

N: 93, E: 48, S: 65, W: 90 – Base results: 86, 98, 50, 82, 80, 53.

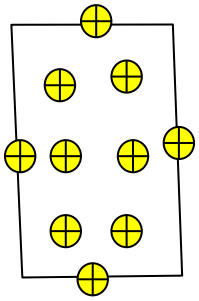
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 18.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Thursday 18.08.22**
Position: Area 1 – Grid square D18 [E - 376285 , N - 407539]	**Time: 1pm**
Comments / Details of soft spot: **A patch of soft, brown soil was removed from the formation ground level before being filled with type 1 material in and rolled.**	

Photo(s) of soft spot

Shear vane records if cohesive soils



N

Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise): 8 x 18 x 0.5m deep.

Shear vane results (kPa):

N: 58, E: 60, S: 70, W: 80 – Base results: 73, 74, 84, 40, 37, 67.

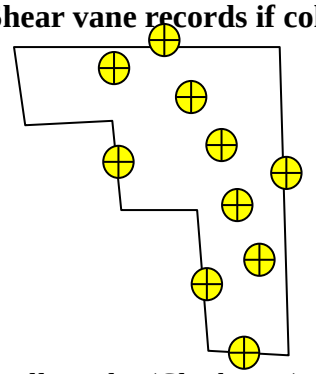
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 22.08.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: R. Hargreaves	**Date: Monday 22.08.22**
Position: Area 3 – Grid square D17 [E - 376282 , N - 407568]	**Time: 12pm**
Comments / Details of soft spot: **Large strip of soft material was removed spanning D16, D17 and 18, before being filled with some hard, type 1 material that was rolled in layers.**	

Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (Clockwise, m): 8, 37, 4, 15, 3, 14, 1, 8. 1.2m deep.
Shear vane results (kPa):
Wall results (Clockwise): 120, 70, 130, 70, 45. – Base results: 115, 130, 85, 85, 65.

	VHE Construction Plc Safety Procedure	Site/Department:	Stopes Road, Bolton
		Contract No:	C 808
		Site Reference:	Soft Spot : 012 – 18G

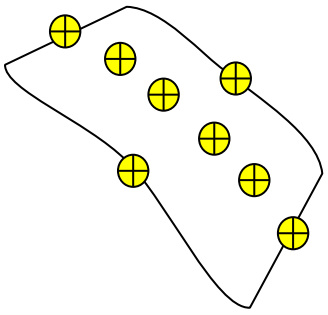
Excavation Inspection Report – Soft Spots at Formation

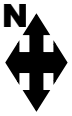
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 21.09.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: I. Broughton	**Date: Wednesday 21.09.22**
Position: Area 4 – Grid square 18G [E - 376,340 , N - 407,557]	**Time: 2pm**
Comments / Details of soft spot: **A strip of soft clay was found when using the RDC roller on the formation level of Area 4. Once found, the clay was removed and stockpiled on the side before using crushed block paving (6F2) as to backfill in 250mm layers and rolled with 8 passes of a 219 Roller.**	

Photo(s) of soft spot

Shear vane records if cohesive soils





Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (m): 3 x 15 x 1.5m deep.

Shear vane results (kPa):

Wall results (Clockwise): 44, 91, 72, 58.– Base results: 60, 55, 48, 91.

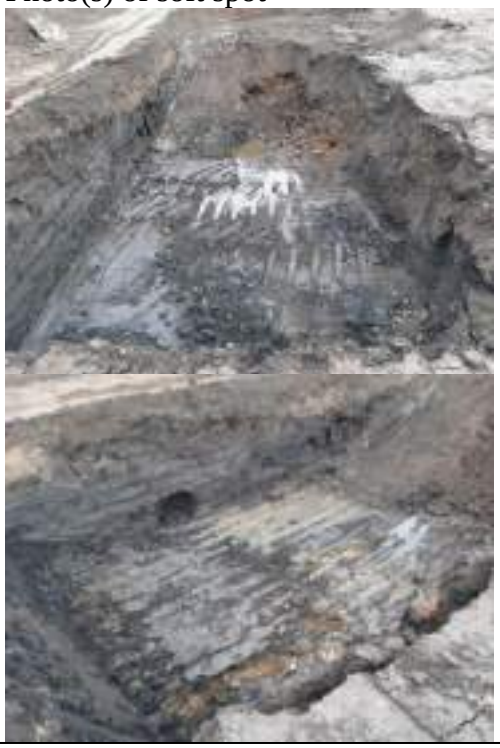
	VHE Construction Plc Safety Procedure	Site/Department:	Stopes Road, Bolton
		Contract No:	C 808
		Site Reference:	Soft Spot : 013 – 20D

Excavation Inspection Report – Soft Spots at Formation

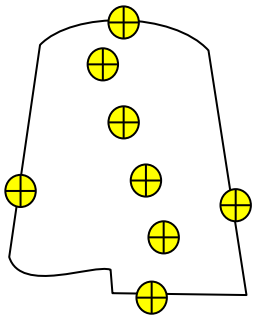
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 22.09.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: I. Broughton	**Date: Thursday 22.09.22**
Position: Area 4 – Grid square D20 [E - 376301 , N - 407511]	**Time: 9am**
Comments / Details of soft spot: **A patch of soft, wet material was found using the RDC roller on the formation level of Area 4. The patch was removed and taken to stockpile on site before being backfilled with crushed block paving (6F2) in 250mm layers and rolled with 8 passes of a 219 Roller.**	

Photo(s) of soft spot



Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (m): 3.5 x 8.3 x 1.2m deep.

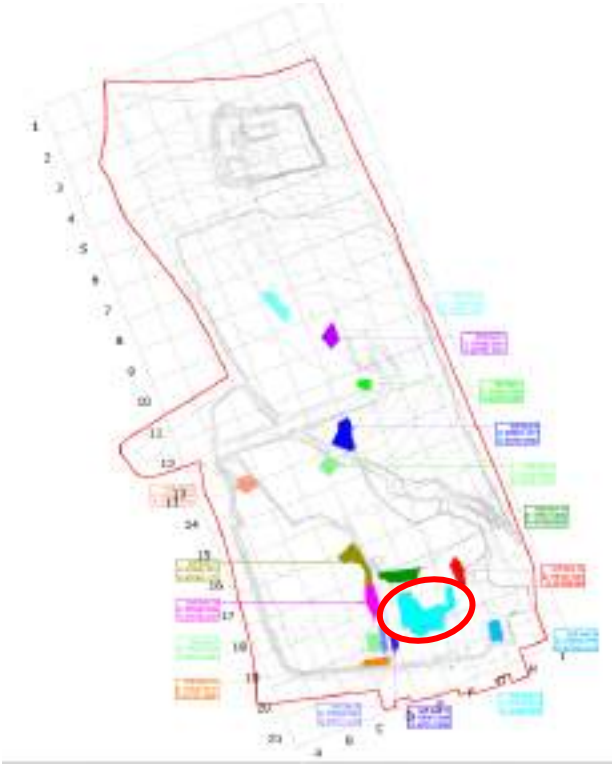
Shear vane results (kPa):

Wall results (Clockwise): 47, 41, 40, 50.– Base results: 54, 48, 47, 49.

Excavation Inspection Report – Soft Spots at Formation

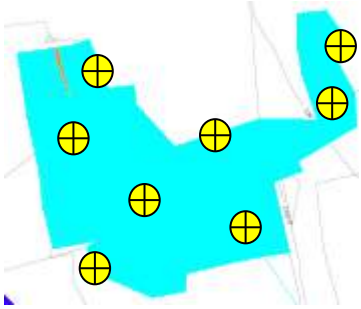
Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 22.09.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: I. Broughton	**Date: Thursday 22.09.22**
Position: Area 4 – Grid square E19, F19 [E - 376326 , N - 407529]	**Time: 1pm**
Comments / Details of soft spot: **A few patches of soft, wet material was found using the RDC roller on the formation level of Area 4. The patches were removed in one large stretch and taken to stockpile on site, before being backfilled with crushed block paving (6F2) in 250mm layers and rolled with 8 passes of a 219 Roller.**	



Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (m): 3m3 x 28m x 1m deep.

Shear vane results (kPa):

Wall results (Clockwise): 60, 60, 90, 47.

Base results: 60, 65, 93, 70.

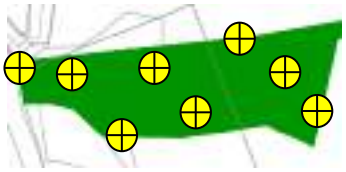
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 23.09.22 Witnessed by - I. Broughton Acceptable : **Y** / ~~N~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: I. Broughton	**Date: Friday 23.09.22**
Position: Area 4 – Grid square E18, F18 [E - 376314 , N - 407559]	**Time: 9am**
Comments / Details of soft spot: **A patch of soft, wet material was found using the RDC roller on the formation level of Area 4. The material was removed and taken to stockpile on site, before backfilling with crushed block paving (6F2) in 250mm layers and rolled with 8 passes of a 219 Roller.**	

Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (m): 24.6 x 7 x 0.7m deep.

Shear vane results (kPa):

Wall results (Clockwise): 55, 80, 59, 73.– Base results: 85, 53, 88, 63.

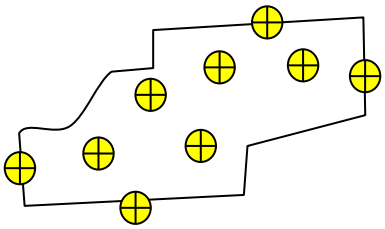
Excavation Inspection Report – Soft Spots at Formation

Notes	
1.	The purpose of this report is to record the findings of the inspection and list the actions taken where defects are found. **AWP Specification Items 10.5.7 and 12.8.1 detail treatment of soft spots**
2.	Proof rolling of formation : Date - 29.09.22 Witnessed by - R. Hargreaves Acceptable : **Y** / ~~**N**~~
3.	The Site Agent/Supervisor must ensure that:- • The proposed method of working is safe. • During the course of the works and at intervals not exceeding 7 days the following checks are made.

Soft spot remedial works Inspected By: I. Broughton	**Date: Wednesday/ Thursday 28-29.09.22**
Position: Area 3 – Grid square D20 [E - 376283 , N - 407502]	**Time: 4pm**
Comments / Details of soft spot: **2 Adjacent strips of soft material were identified when using the RDC roller on the surrounding formation level of Area 3. The strips were excavated on consecutive days and stockpiled elsewhere on site, before being backfilled with crushed block paving (6F2) in 250mm layers and rolled with 8 passes of a 219 Roller.**	

Photo(s) of soft spot

Shear vane records if cohesive soils



Clay / cohesive soils at base or sides of excavation, tested with hand shear vane – as detailed.

Dimensions of Hotspot (m): 16.1 x 3.7 x 1m deep.

Shear vane results (kPa):

Wall results (Clockwise): 60, 70, 65, 48.– Base results: 50, 49, 48, 89, 70.

APPENDIX F

Chemical Certificates

Matthew Mains
VHE Construction plc
Whaley Road
Barug
Barnsley
S75 1HT

e: VHE Group

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
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t: 01923 225404
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Analytical Report Number : 22-63014

Project / Site name:	Stopes Road	**Samples received on:**	06/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	07/06/2022
Your order number:		**Analysis completed by:**	15/06/2022
Report Issue Number:	1	**Report issued on:**	15/06/2022
Samples Analysed:	9 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302986	2302987	2302988	2302989	2302990
Sample Reference				TPB13-1	TPB13-2	TPB13-3	TPB13-4	TPB15-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-1.00	1.00-2.00	2.00-2.80	2.80-4.00	0.10-0.80
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	21	5	26	46	13
Moisture Content	%	0.01	NONE	6.7	8.1	8.2	8.4	6.5
Total mass of sample received	kg	0.001	NONE	0.8	1.2	0.8	1.2	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	0.001
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.2	7.4	6.2	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	770	580	970	1600	360
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.39	0.29	0.49	0.79	0.18
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	387	289	487	795	180
Total Potential Sulphate	mg/kg	30	NONE	3400	2800	4600	11000	3000
Sulphide	mg/kg	1	MCERTS	63	48	160	5.4	48
Elemental Sulphur	mg/kg	5	MCERTS	12	9	140	180	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1100	940	1500	3600	1000
Total Sulphur	%	0.005	MCERTS	0.114	0.094	0.154	0.358	0.1
Organic Matter (automated)	%	0.1	MCERTS	2.8	4.1	4.1	5.6	2.7
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.016	0.024	0.024	0.032	0.016

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.82	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.94	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.53	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.46	6.2	1.2	2.5	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.6	0.33	0.33	0.36
Fluoranthene	mg/kg	0.05	MCERTS	0.76	9.7	2.8	2	1.8
Pyrene	mg/kg	0.05	MCERTS	0.83	9	2.7	1.7	1.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.37	4.7	1.6	0.97	0.84
Chrysene	mg/kg	0.05	MCERTS	0.43	3.7	1.4	0.73	0.97
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.39	4.6	1.3	0.72	1.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	1.8	0.84	0.38	0.33
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.35	4.2	1.4	0.5	0.89
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.9	0.7	< 0.05	0.34
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.62	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	2.6	0.97	< 0.05	0.54

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.78	52.1	15.3	10.7	10

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	41	62	29	33	29
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	2.5	3.1	1.6	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.8	2.2	0.8	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

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Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302986	2302987	2302988	2302989	2302990
Sample Reference				TPB13-1	TPB13-2	TPB13-3	TPB13-4	TPB15-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-1.00	1.00-2.00	2.00-2.80	2.80-4.00	0.10-0.80
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	30	30	24	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	75	85	94	74	77
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	55	35	39	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	0.6	< 0.3	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	49	68	35	41
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	55	77	90	40	58
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	73	42	33	71
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302986	2302987	2302988	2302989	2302990
Sample Reference				TPB13-1	TPB13-2	TPB13-3	TPB13-4	TPB15-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-1.00	1.00-2.00	2.00-2.80	2.80-4.00	0.10-0.80
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	56	210	57	< 10	240
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	2.5
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	11
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	91
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	18
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	100
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	120
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	5.5	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	48	15	< 10	12
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	47	130	42	< 10	83
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	29	< 8.4	< 8.4	22
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	56	180	57	< 10	95
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	56	210	57	< 10	120

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302991	2302992	2302993	2302994
Sample Reference				TPB15-2	TPB15-3	TPB15-4	TPB16-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-2.00	2.00-3.50	3.50-4.00	0.10-1.00
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	27	33	31	24
Moisture Content	%	0.01	NONE	9.1	6	10	9.9
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Chrysotile	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.005	< 0.001	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.005	< 0.001	< 0.001	-
Asbestos Analyst ID	N/A	N/A	N/A	BPA	BPA	BPA	BPA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.4	8.3	7.7	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1800	440	1500	600
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.92	0.22	0.73	0.3
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	918	220	726	299
Total Potential Sulphate	mg/kg	30	NONE	5400	2100	11000	2900
Sulphide	mg/kg	1	MCERTS	22	88	11	21
Elemental Sulphur	mg/kg	5	MCERTS	8	< 5.0	33	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1800	710	3600	960
Total Sulphur	%	0.005	MCERTS	0.181	0.071	0.356	0.096
Organic Matter (automated)	%	0.1	MCERTS	3.2	2.4	7.3	4.1
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.019	0.014	0.043	0.024

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.23	0.67
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.2	0.33
Phenanthrene	mg/kg	0.05	MCERTS	0.74	0.28	2.8	4.2
Anthracene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.58	0.85
Fluoranthene	mg/kg	0.05	MCERTS	0.96	0.38	2.8	6.2
Pyrene	mg/kg	0.05	MCERTS	1	0.4	2.4	5.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.49	0.22	1.4	3.1
Chrysene	mg/kg	0.05	MCERTS	0.46	0.24	1.1	2.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.51	0.23	0.99	2.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.24	0.09	0.54	1.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.44	< 0.05	0.85	2.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.38
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.48	1.7

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.08	1.84	15.8	33.9

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	47	26	38	78
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.2	2.1	1.3	2.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	1.6	1.5	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302991	2302992	2302993	2302994
Sample Reference				TPB15-2	TPB15-3	TPB15-4	TPB16-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-2.00	2.00-3.50	3.50-4.00	0.10-1.00
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	27	16	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	67	81	76
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	32	93	61
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	54	38	32	42
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	72	64	37	73
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77	61	63	90
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 22-63014
Project / Site name: Stopes Road

Lab Sample Number				2302991	2302992	2302993	2302994
Sample Reference				TPB15-2	TPB15-3	TPB15-4	TPB16-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-2.00	2.00-3.50	3.50-4.00	0.10-1.00
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Petroleum Hydrocarbons							
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	690	< 10	18	33
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	4.5	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	21	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	280	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	93	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	300	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	390	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	4	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	22	< 10	< 10	14
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	190	< 10	11	20
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	77	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	220	< 10	18	33
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	300	< 10	18	33

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: **22-63014**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2302990	TPB15-1	0.10-0.80	175	Loose Fibrous Debris	**Chrysotile**	0.001	**0.001**
2302991	TPB15-2	0.80-2.00	134	Loose Fibrous Debris & Loose Fibres	**Chrysotile & Amosite**	0.005	**0.005**
2302992	TPB15-3	2.00-3.50	167	Loose Fibrous Debris	**Chrysotile**	< 0.001	**< 0.001**
2302993	TPB15-4	3.50-4.00	144	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 22-63014
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2302986	TPB13-1	None Supplied	0.10-1.00	Brown gravelly sand with stones.
2302987	TPB13-2	None Supplied	1.00-2.00	Brown gravelly sand with stones.
2302988	TPB13-3	None Supplied	2.00-2.80	Brown gravelly sand with stones.
2302989	TPB13-4	None Supplied	2.80-4.00	Brown sand with gravel and stones.
2302990	TPB15-1	None Supplied	0.10-0.80	Brown sand with gravel and stones.
2302991	TPB15-2	None Supplied	0.80-2.00	Brown sand with gravel and stones.
2302992	TPB15-3	None Supplied	2.00-3.50	Brown sand with gravel and stones.
2302993	TPB15-4	None Supplied	3.50-4.00	Brown sand with gravel and stones.
2302994	TPB16-1	None Supplied	0.10-1.00	Brown sand with gravel and stones.

Analytical Report Number : 22-63014
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-63014
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-63015

Replaces Analytical Report Number: 22-63015, issue no. 1
Client references/information amended.

Project / Site name:	Stopes Road	**Samples received on:**	06/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	07/06/2022
Your order number:		**Analysis completed by:**	06/07/2022
Report Issue Number:	2	**Report issued on:**	06/07/2022
Samples Analysed:	18 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2302995	2302996	2302997	2302998	2302999
Sample Reference				TPB14-1	TPB14-2	TPB14-3	TPB14-4	TPC14-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-1.00	1.00-1.70	1.70-3.00	3.00-4.00	0.10-0.50
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	23	32	14	55	54
Moisture Content	%	0.01	NONE	5.2	5.8	11	11	2.9
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	8.0	8.2	6.5	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	930	750	1400	1500	320
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.46	0.38	0.69	0.75	0.16
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	464	376	685	754	158
Total Potential Sulphate	mg/kg	30	NONE	2400	2300	7900	32000	2700
Sulphide	mg/kg	1	MCERTS	16	17	110	4.8	5.7
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	11	79	6.6
Total Sulphur	mg/kg	50	MCERTS	820	770	2600	11000	920
Total Sulphur	%	0.005	MCERTS	0.082	0.077	0.262	1.08	0.092
Organic Matter (automated)	%	0.1	MCERTS	2.5	1.7	2.1	6.4	1.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.015	0.0097	0.012	0.037	0.0077
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	1	1.2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.22
Fluoranthene	mg/kg	0.05	MCERTS	0.55	< 0.05	< 0.05	0.29	2
Pyrene	mg/kg	0.05	MCERTS	0.53	< 0.05	< 0.05	0.3	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28	< 0.05	< 0.05	< 0.05	1
Chrysene	mg/kg	0.05	MCERTS	0.32	< 0.05	< 0.05	< 0.05	0.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05	< 0.05	1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.18	< 0.05	< 0.05	< 0.05	0.47
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.55
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.68	< 0.80	< 0.80	2.85	10.5
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	31	33	41	65	8.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	1.5	1.8	0.74	0.75
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.5	2.9	0.3	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2302995	2302996	2302997	2302998	2302999
Sample Reference				TPB14-1	TPB14-2	TPB14-3	TPB14-4	TPC14-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-1.00	1.00-1.70	1.70-3.00	3.00-4.00	0.10-0.50
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	15	19	10	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70	94	78	45	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	7.8	16	43	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	39	38	43	15	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	42	53	25	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	29	21	33	24	32
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	170
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	34
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	18
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	34
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	51
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	13
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	77
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	58
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	90
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	< 10	< 10	< 10	150

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303000	2303001	2303002	2303003	2303004
Sample Reference				TPC14-2	TPC14-3	TPC14-4	TPC14-5	TPD14-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	1.70-2.00	2.00-2.40	2.40-4.00	0.10-0.30
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	22	32	49	61	40
Moisture Content	%	0.01	NONE	7.2	8.8	6.7	6.7	4.1
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.003	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.003	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	8.0	5.7	7.1	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	880	1000	560	640	280
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.44	0.5	0.28	0.32	0.14
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	438	502	279	321	139
Total Potential Sulphate	mg/kg	30	NONE	4700	5500	10000	8500	2100
Sulphide	mg/kg	1	MCERTS	61	55	32	1.7	94
Elemental Sulphur	mg/kg	5	MCERTS	32	34	38	46	14
Total Sulphur	mg/kg	50	MCERTS	1600	1800	3300	2800	710
Total Sulphur	%	0.005	MCERTS	0.155	0.184	0.335	0.284	0.071
Organic Matter (automated)	%	0.1	MCERTS	3.9	6.3	5.2	1.6	2.2
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.023	0.037	0.03	0.009	0.013
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.6	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.84	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.71	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1.8	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.9	5.7	0.7	< 0.05	0.81
Anthracene	mg/kg	0.05	MCERTS	0.51	1.5	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.8	7.7	0.44	0.44	1.3
Pyrene	mg/kg	0.05	MCERTS	2.6	6.9	0.44	0.4	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.6	3.8	0.26	< 0.05	0.69
Chrysene	mg/kg	0.05	MCERTS	1.5	3.3	0.28	< 0.05	0.57
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.6	3.7	0.21	< 0.05	0.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.59	1.6	0.14	< 0.05	0.33
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.4	2.9	< 0.05	< 0.05	0.64
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.67	1.6	< 0.05	< 0.05	0.33
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.97	2.3	< 0.05	< 0.05	0.4
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	16	44.7	3.07	0.84	7.14
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	45	42	21	19	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	4.4	3.1	1.5	1.6	0.73
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	1.1	1.9	0.4	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303000	2303001	2303002	2303003	2303004
Sample Reference				TPC14-2	TPC14-3	TPC14-4	TPC14-5	TPD14-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	1.70-2.00	2.00-2.40	2.40-4.00	0.10-0.30
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	34	17	18	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	97	110	66	60	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	45	44	40	32	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	84	57	36	31	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	100	78	26	31	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	51	60	24	66
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	39	340	< 10	< 10	360
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	52	< 8.0	< 8.0	81
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	40	< 8.4	< 8.4	39
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	57	< 10	< 10	86
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	97	< 10	< 10	130
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	2.7	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	24	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	12	52	< 10	< 10	11
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	28	140	< 10	< 10	130
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	42	< 8.4	< 8.4	140
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	39	220	< 10	< 10	140
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	39	260	< 10	< 10	290

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303005	2303006	2303007	2303008	2303009
Sample Reference				TPD14-2	TPD14-3	TPD14-4	TPD14-5	TPC13-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.70	0.70-1.60	1.60-2.30	3.00-4.00	0.10-0.30
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	30	< 0.1	15	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.4	10	9.9	11	5.8
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.002	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.002	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	SFS	SFS	SFS	SFS	SFS
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.6	7.4	7.3	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	300	690	680	300	360
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.35	0.34	0.15	0.18
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	152	346	339	152	180
Total Potential Sulphate	mg/kg	30	NONE	3300	7200	14000	1900	2200
Sulphide	mg/kg	1	MCERTS	22	9	6.6	32	32
Elemental Sulphur	mg/kg	5	MCERTS	8.3	5.6	< 5.0	56	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1100	2400	4500	640	740
Total Sulphur	%	0.005	MCERTS	0.111	0.239	0.455	0.064	0.074
Organic Matter (automated)	%	0.1	MCERTS	4.8	9.5	7.1	2.3	3.2
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.028	0.055	0.041	0.014	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.1
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.54	< 0.05	< 0.05	< 0.05	0.8
Acenaphthylene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	< 0.05	0.55
Acenaphthene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05	< 0.05	1.8
Fluorene	mg/kg	0.05	MCERTS	0.83	0.22	< 0.05	< 0.05	1.8
Phenanthrene	mg/kg	0.05	MCERTS	4.3	1.7	1.9	0.56	18
Anthracene	mg/kg	0.05	MCERTS	1	0.46	0.6	< 0.05	3.9
Fluoranthene	mg/kg	0.05	MCERTS	4.9	2.2	2.8	0.9	28
Pyrene	mg/kg	0.05	MCERTS	4.2	1.9	2.6	0.89	25
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.5	1.1	1.4	0.4	16
Chrysene	mg/kg	0.05	MCERTS	2	1	1.3	0.45	10
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.5	1.2	1.6	0.4	15
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.9	0.56	0.54	0.17	5.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1	1.1	1.3	0.39	14
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.58	0.57	< 0.05	6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	< 0.05	1.8
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.9	0.85	< 0.05	7.6
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	29.2	12.8	15.4	4.16	157
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	30	45	55	9.8	31
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.6	2.1	2.6	0.92	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.6	0.6	1.8	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303005	2303006	2303007	2303008	2303009
Sample Reference				TPD14-2	TPD14-3	TPD14-4	TPD14-5	TPC13-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.70	0.70-1.60	1.60-2.30	3.00-4.00	0.10-0.30
Date Sampled				30/05/2022	30/05/2022	30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	22	22	18	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	85	140	210	30	56
Lead (aqua regia extractable)	mg/kg	1	MCERTS	55	81	71	14	40
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	49	51	66	31	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	60	60	72	23	46
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82	88	69	61	64
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	120	19	41	28	290
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	41	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	15	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	41	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	56	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	6.8	< 2.0	< 2.0	< 2.0	10
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	17	< 10	11	< 10	77
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	47	11	30	19	170
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	45
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	71	19	41	28	260
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	71	19	41	28	300

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303010	2303011	2303012
Sample Reference				TPC13-2	TPC13-3	TPC13-4
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.80	1.00-2.00	2.00-4.00
Date Sampled				30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	39	39
Moisture Content	%	0.01	NONE	7.9	8.9	8.5
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Amosite	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.129	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.129	< 0.001	-
Asbestos Analyst ID	N/A	N/A	N/A	SFS	SFS	SFS
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	8.1	7.5	6.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	980	1600	2500
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.49	0.78	1.2
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	491	775	1240
Total Potential Sulphate	mg/kg	30	NONE	7000	8100	20000
Sulphide	mg/kg	1	MCERTS	71	22	24
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	130	370
Total Sulphur	mg/kg	50	MCERTS	2300	2700	6700
Total Sulphur	%	0.005	MCERTS	0.235	0.27	0.667
Organic Matter (automated)	%	0.1	MCERTS	11	5.5	7.7
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.062	0.032	0.045
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	1.8	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	6.8	0.69	1.3
Acenaphthylene	mg/kg	0.05	MCERTS	2.2	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	18	0.31	0.26
Fluorene	mg/kg	0.05	MCERTS	17	0.25	0.34
Phenanthrene	mg/kg	0.05	MCERTS	140	2.2	2.8
Anthracene	mg/kg	0.05	MCERTS	30	0.44	0.71
Fluoranthene	mg/kg	0.05	MCERTS	200	2.7	2.2
Pyrene	mg/kg	0.05	MCERTS	180	2.3	2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	68	1.3	1
Chrysene	mg/kg	0.05	MCERTS	52	1.3	1.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	66	1.2	0.92
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	22	0.57	0.49
Benzo(a)pyrene	mg/kg	0.05	MCERTS	53	1.1	0.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	29	0.49	0.28
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	7	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	37	0.65	0.36
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	927	15.6	14.5
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	49	63	38
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.3	2.7	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	5.4	2.3	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63015
Project / Site name: Stopes Road

Lab Sample Number				2303010	2303011	2303012
Sample Reference				TPC13-2	TPC13-3	TPC13-4
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.80	1.00-2.00	2.00-4.00
Date Sampled				30/05/2022	30/05/2022	30/05/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	26	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	87	110	85
Lead (aqua regia extractable)	mg/kg	1	MCERTS	67	72	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	51	60	46
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	59	69	38
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	98	89	100
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	2400	33	33
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	4.2	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	12	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	86	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	25	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	100	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	130	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	4.9	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	66	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	650	14	17
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	1400	20	16
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	250	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	2100	33	33
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	2400	33	33

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-63015
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2302995	TPB14-1	None Supplied	0.10-1.00	Brown sand with gravel and stones.
2302996	TPB14-2	None Supplied	1.00-1.70	Brown sand with gravel and stones.
2302997	TPB14-3	None Supplied	1.70-3.00	Brown sand with gravel and stones.
2302998	TPB14-4	None Supplied	3.00-4.00	Brown clay and sand with gravel and stones.
2302999	TPC14-1	None Supplied	0.10-0.50	Brown sand with gravel and stones.
2303000	TPC14-2	None Supplied	0.50-1.00	Brown sand with gravel and stones.
2303001	TPC14-3	None Supplied	1.70-2.00	Brown sand with gravel and stones.
2303002	TPC14-4	None Supplied	2.00-2.40	Brown sand with gravel and stones.
2303003	TPC14-5	None Supplied	2.40-4.00	Brown sand with gravel and stones.
2303004	TPD14-1	None Supplied	0.10-0.30	Brown sand with gravel and stones.
2303005	TPD14-2	None Supplied	0.30-0.70	Brown sand with gravel and stones.
2303006	TPD14-3	None Supplied	0.70-1.60	Brown sand with gravel.
2303007	TPD14-4	None Supplied	1.60-2.30	Brown sand with gravel and stones.
2303008	TPD14-5	None Supplied	3.00-4.00	Brown clay and sand with gravel.
2303009	TPC13-1	None Supplied	0.10-0.30	Brown sand with gravel.
2303010	TPC13-2	None Supplied	0.30-0.80	Brown sand with gravel.
2303011	TPC13-3	None Supplied	1.00-2.00	Brown sand with gravel and stones.
2303012	TPC13-4	None Supplied	2.00-4.00	Brown sand with gravel and stones.

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Analytical Report Number : 22-63015
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

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Analytical Report Number : 22-63015
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-63015
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TPB14-1	None Supplied	S	2302995	c	Sulphide in soil	L010-PL	c
TPB14-1	None Supplied	S	2302995	c	Total cyanide in soil	L080-PL	c
TPB14-2	None Supplied	S	2302996	c	Sulphide in soil	L010-PL	c
TPB14-2	None Supplied	S	2302996	c	Total cyanide in soil	L080-PL	c
TPB14-3	None Supplied	S	2302997	c	Sulphide in soil	L010-PL	c
TPB14-3	None Supplied	S	2302997	c	Total cyanide in soil	L080-PL	c
TPB14-4	None Supplied	S	2302998	c	Sulphide in soil	L010-PL	c
TPB14-4	None Supplied	S	2302998	c	Total cyanide in soil	L080-PL	c
TPC13-1	None Supplied	S	2303009	c	Sulphide in soil	L010-PL	c
TPC13-1	None Supplied	S	2303009	c	Total cyanide in soil	L080-PL	c
TPC13-2	None Supplied	S	2303010	c	Sulphide in soil	L010-PL	c
TPC13-2	None Supplied	S	2303010	c	Total cyanide in soil	L080-PL	c
TPC13-3	None Supplied	S	2303011	c	Sulphide in soil	L010-PL	c
TPC13-3	None Supplied	S	2303011	c	Total cyanide in soil	L080-PL	c
TPC13-4	None Supplied	S	2303012	c	Sulphide in soil	L010-PL	c
TPC13-4	None Supplied	S	2303012	c	Total cyanide in soil	L080-PL	c
TPC14-1	None Supplied	S	2302999	c	Sulphide in soil	L010-PL	c
TPC14-1	None Supplied	S	2302999	c	Total cyanide in soil	L080-PL	c
TPC14-2	None Supplied	S	2303000	c	Sulphide in soil	L010-PL	c
TPC14-2	None Supplied	S	2303000	c	Total cyanide in soil	L080-PL	c
TPC14-3	None Supplied	S	2303001	c	Sulphide in soil	L010-PL	c
TPC14-3	None Supplied	S	2303001	c	Total cyanide in soil	L080-PL	c
TPC14-4	None Supplied	S	2303002	c	Sulphide in soil	L010-PL	c
TPC14-4	None Supplied	S	2303002	c	Total cyanide in soil	L080-PL	c
TPC14-5	None Supplied	S	2303003	c	Sulphide in soil	L010-PL	c
TPC14-5	None Supplied	S	2303003	c	Total cyanide in soil	L080-PL	c
TPD14-1	None Supplied	S	2303004	c	Sulphide in soil	L010-PL	c
TPD14-1	None Supplied	S	2303004	c	Total cyanide in soil	L080-PL	c
TPD14-2	None Supplied	S	2303005	c	Sulphide in soil	L010-PL	c
TPD14-2	None Supplied	S	2303005	c	Total cyanide in soil	L080-PL	c
TPD14-3	None Supplied	S	2303006	c	Sulphide in soil	L010-PL	c
TPD14-3	None Supplied	S	2303006	c	Total cyanide in soil	L080-PL	c
TPD14-4	None Supplied	S	2303007	c	Sulphide in soil	L010-PL	c
TPD14-4	None Supplied	S	2303007	c	Total cyanide in soil	L080-PL	c
TPD14-5	None Supplied	S	2303008	c	Sulphide in soil	L010-PL	c
TPD14-5	None Supplied	S	2303008	c	Total cyanide in soil	L080-PL	c

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Matthew Mains
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e: VHE Group

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Analytical Report Number : 22-63016

Project / Site name:	Stopes Road	**Samples received on:**	06/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	07/06/2022
Your order number:		**Analysis completed by:**	13/06/2022
Report Issue Number:	1	**Report issued on:**	13/06/2022
Samples Analysed:	8 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-63016
Project / Site name: Stopes Road

Lab Sample Number				2303013	2303014	2303015	2303016	2303017
Sample Reference				TPD6-1	TPD8-1	TPE8-1	TPC9-1	TPC7-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.50	0.10-0.40	1.30-1.50	0.40-1.50	1.00-1.20
Date Sampled				26/05/2022	26/05/2022	26/05/2022	26/05/2022	26/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	18	64	47	18	71
Moisture Content	%	0.01	NONE	8.4	5.1	9.8	12	8.1
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ	KSZ	KSZ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.5	8.5	8.6	7.9	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	250	230	310	3100	250
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.12	0.15	1.6	0.12
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	123	115	153	1570	124
Total Potential Sulphate	mg/kg	30	NONE	2100	960	2500	4800	1300
Sulphide	mg/kg	1	MCERTS	26	14	7.2	4.9	14
Elemental Sulphur	mg/kg	5	MCERTS	7.7	< 5.0	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	720	320	840	1600	450
Total Sulphur	%	0.005	MCERTS	0.072	0.032	0.084	0.161	0.045
Organic Matter (automated)	%	0.1	MCERTS	3.4	1.2	2.5	3.3	1
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.02	0.007	0.014	0.019	0.006
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.65	< 0.05	0.29	< 0.05	0.36
Anthracene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.83	0.4	0.34	< 0.05	0.63
Pyrene	mg/kg	0.05	MCERTS	0.82	0.46	0.39	< 0.05	0.63
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.38	0.18	0.26	< 0.05	0.28
Chrysene	mg/kg	0.05	MCERTS	0.41	0.24	0.23	< 0.05	0.38
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.36	< 0.05	< 0.05	< 0.05	0.33
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	< 0.05	0.21
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	< 0.05	0.38
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.58	1.28	1.51	< 0.80	3.2

Analytical Report Number: 22-63016
Project / Site name: Stopes Road

Lab Sample Number				2303013	2303014	2303015	2303016	2303017
Sample Reference				TPD6-1	TPD8-1	TPE8-1	TPC9-1	TPC7-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80-1.50	0.10-0.40	1.30-1.50	0.40-1.50	1.00-1.20
Date Sampled				26/05/2022	26/05/2022	26/05/2022	26/05/2022	26/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	11	51	72	8.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	0.69	1.6	2.2	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.4	3.1	2.9	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	19	22	28	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	58	21	65	70	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	26	19	36	42
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	24	37	49	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	41	23	52	93	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	61	38	59	58
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	28
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	20
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	28
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	28

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-63016
Project / Site name: Stopes Road

Lab Sample Number				2303018	2303019	2303020
Sample Reference				TPD7-1	TPD9-1	TPE9-1
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.60	1.20-1.50	0.10-0.40
Date Sampled				26/05/2022	26/05/2022	26/05/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	40	61	48
Moisture Content	%	0.01	NONE	5.9	9	2.5
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	10.8	9.1	9.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	950	590	120
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.48	0.3	0.061
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	476	296	61.3
Total Potential Sulphate	mg/kg	30	NONE	5000	1600	460
Sulphide	mg/kg	1	MCERTS	86	15	3.3
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1700	520	150
Total Sulphur	%	0.005	MCERTS	0.165	0.052	0.015
Organic Matter (automated)	%	0.1	MCERTS	1.8	1.6	0.8
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.011	0.009	0.0044
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.41	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.4	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.2	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	7.8	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	7	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.9	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	2.9	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.5	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.6	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.5	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.41	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.8	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	40	< 0.80	< 0.80

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63016
Project / Site name: Stopes Road

Lab Sample Number				2303018	2303019	2303020
Sample Reference				TPD7-1	TPD9-1	TPE9-1
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.60	1.20-1.50	0.10-0.40
Date Sampled				26/05/2022	26/05/2022	26/05/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	24	32	5.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.3	0.42
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	4	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	19	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45	46	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	47	18	6.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	30	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37	46	17
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	42	38
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	160	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	9.5	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	39	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	89	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	20	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	140	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	160	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 22-63016
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2303013	TPD6-1	None Supplied	0.80-1.50	Brown sand with gravel and stones.
2303014	TPD8-1	None Supplied	0.10-0.40	Brown clay and sand with gravel and stones.
2303015	TPE8-1	None Supplied	1.30-1.50	Brown clay and sand with gravel and stones.
2303016	TPC9-1	None Supplied	0.40-1.50	Brown sandy clay with stones.
2303017	TPC7-1	None Supplied	1.00-1.20	Brown clay and sand with stones and brick.
2303018	TPD7-1	None Supplied	0.00-0.60	Brown loam and sand with stones and vegetation.
2303019	TPD9-1	None Supplied	1.20-1.50	Brown sandy gravel with stones.
2303020	TPE9-1	None Supplied	0.10-0.40	Brown sand with stones and gravel

Analytical Report Number : 22-63016
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-63016
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-63016
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TPC7-1	None Supplied	S	2303017	c	Sulphide in soil	L010-PL	c
TPC7-1	None Supplied	S	2303017	c	Total cyanide in soil	L080-PL	c
TPC9-1	None Supplied	S	2303016	c	Sulphide in soil	L010-PL	c
TPC9-1	None Supplied	S	2303016	c	Total cyanide in soil	L080-PL	c
TPD6-1	None Supplied	S	2303013	c	Sulphide in soil	L010-PL	c
TPD6-1	None Supplied	S	2303013	c	Total cyanide in soil	L080-PL	c
TPD7-1	None Supplied	S	2303018	c	Sulphide in soil	L010-PL	c
TPD7-1	None Supplied	S	2303018	c	Total cyanide in soil	L080-PL	c
TPD8-1	None Supplied	S	2303014	c	Sulphide in soil	L010-PL	c
TPD8-1	None Supplied	S	2303014	c	Total cyanide in soil	L080-PL	c
TPD9-1	None Supplied	S	2303019	c	Sulphide in soil	L010-PL	c
TPD9-1	None Supplied	S	2303019	c	Total cyanide in soil	L080-PL	c
TPE8-1	None Supplied	S	2303015	c	Sulphide in soil	L010-PL	c
TPE8-1	None Supplied	S	2303015	c	Total cyanide in soil	L080-PL	c
TPE9-1	None Supplied	S	2303020	c	Sulphide in soil	L010-PL	c
TPE9-1	None Supplied	S	2303020	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-63556

Project / Site name:	Stopes Road	**Samples received on:**	08/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	08/06/2022
Your order number:		**Analysis completed by:**	16/06/2022
Report Issue Number:	1	**Report issued on:**	16/06/2022
Samples Analysed:	9 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63556
Project / Site name: Stopes Road

Lab Sample Number				2306018	2306019	2306020	2306021	2306022
Sample Reference				TPC15-1	TPC15-2	TPC15-3	TPC15-4	TPC15-5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.20	3.20-4.00
Date Sampled				01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	57	42	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	3.7	6.5	18	16	14
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Analyst ID	N/A	N/A	N/A	BPA	BPA	BPA	BPA	BPA
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	8.3	8.4	7	4.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	76	97	650	1200	1300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.038	0.048	0.33	0.58	0.65
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	37.8	48.3	326	577	651
Total Potential Sulphate	mg/kg	30	NONE	640	1200	4000	5400	18000
Sulphide	mg/kg	1	MCERTS	13	30	25	15	15
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	10	11	190	290
Total Sulphur	mg/kg	50	MCERTS	210	390	1300	1800	6000
Total Sulphur	%	0.005	MCERTS	0.021	0.039	0.133	0.18	0.602
Organic Matter (automated)	%	0.1	MCERTS	0.9	1.4	2	5	6.6
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0053	0.0081	0.012	0.029	0.038
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.35	1.6	2.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	2.1	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.21	0.96	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	3.2	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.35	1.8	9.5	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.45	2.3	0.29
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.48	4.2	13	1.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.62	3.9	13	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.26	2.1	8.8	0.97
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.23	1.9	8.8	0.77
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	10	0.51
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	3.8	0.5
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	7.7	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.81	4.2	0.26
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.19	1.1	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	6	0.36
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	1.94	21.1	96.3	11.2

Analytical Report Number: 22-63556
Project / Site name: Stopes Road

Lab Sample Number				2306018	2306019	2306020	2306021	2306022
Sample Reference				TPC15-1	TPC15-2	TPC15-3	TPC15-4	TPC15-5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.20	3.20-4.00
Date Sampled				01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.9	18	69	67	74
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.43	1.1	2.1	3.1	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	< 0.2	3.2	2.3	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	15	28	24	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	36	78	88	85
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.8	22	38	57	73
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	25	45	54	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18	37	72	69	69
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	30	31	96	59	47
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	170	230	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	4	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	21	14	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	91	75	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	38	34	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	120	88	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	150	120	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	4.8	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	12	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	28	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	21	56	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	14	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	29	100	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	29	110	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-63556
Project / Site name: Stopes Road

Lab Sample Number				2306023	2306024	2306025	2306026
Sample Reference				TPD15-1	TPD15-2	TPD15-3	TPD15-4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.70	2.70-4.00
Date Sampled				01/06/2022	01/06/2022	01/06/2022	01/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	4.5	9.9	12	13
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-
Asbestos Analyst ID	N/A	N/A	N/A	BPA	BPA	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	8.6	7.9	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	100	300	550	1100
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.052	0.15	0.28	0.55
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	51.5	149	277	547
Total Potential Sulphate	mg/kg	30	NONE	1400	2700	4800	6100
Sulphide	mg/kg	1	MCERTS	55	43	41	47
Elemental Sulphur	mg/kg	5	MCERTS	12	11	74	16
Total Sulphur	mg/kg	50	MCERTS	480	900	1600	2000
Total Sulphur	%	0.005	MCERTS	0.048	0.09	0.161	0.204
Organic Matter (automated)	%	0.1	MCERTS	2.5	2.2	4.9	2.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.014	0.013	0.028	0.013

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.37	3.6	0.58
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.8	0.3
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.77	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.4	0.46
Phenanthrene	mg/kg	0.05	MCERTS	0.21	0.53	8.5	1.6
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.5	0.36
Fluoranthene	mg/kg	0.05	MCERTS	0.2	0.89	6.7	1.4
Pyrene	mg/kg	0.05	MCERTS	0.28	1	5.8	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.61	3.9	0.82
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.52	2.9	0.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.41	3.8	0.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.35	1.4	0.45
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.32	2.8	0.51
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.21	1.3	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.38	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.29	1.7	0.41

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	5.5	52.3	9.64

Analytical Report Number: 22-63556
Project / Site name: Stopes Road

Lab Sample Number				2306023	2306024	2306025	2306026
Sample Reference				TPD15-1	TPD15-2	TPD15-3	TPD15-4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.70	2.70-4.00
Date Sampled				01/06/2022	01/06/2022	01/06/2022	01/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	41	33	49
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.56	1.7	1.9	2.2
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	2.3	0.7	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	24	23	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	72	370	160
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	41	100	73
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	35	75	62
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	58	50	61
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	41	85	300	100
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	810	220	390	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	8.9	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	9.6	35	26	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	390	170	70	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	66	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	400	220	97	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	470	220	97	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	4	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	25	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	97	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	280	< 10	160	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	47	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	290	< 10	290	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	340	< 10	290	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-63556
Project / Site name: Stopes Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2306020	TPC15-3	1.00-2.00	118	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
2306024	TPD15-2	0.30-1.00	135	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 22-63556
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2306018	TPC15-1	None Supplied	0.10-0.30	Brown clay and sand with stones.
2306019	TPC15-2	None Supplied	0.30-1.00	Brown sand with stones.
2306020	TPC15-3	None Supplied	1.00-2.00	Brown sand with gravel.
2306021	TPC15-4	None Supplied	2.00-3.20	Brown clay and sand with gravel.
2306022	TPC15-5	None Supplied	3.20-4.00	Brown clay and sand with gravel.
2306023	TPD15-1	None Supplied	0.10-0.30	Brown clay and sand with gravel.
2306024	TPD15-2	None Supplied	0.30-1.00	Brown clay and sand with gravel.
2306025	TPD15-3	None Supplied	1.00-2.70	Brown clay and sand with gravel.
2306026	TPD15-4	None Supplied	2.70-4.00	Brown clay and sand with gravel.

Analytical Report Number : 22-63556
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-63556
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-63556
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TPC15-1	None Supplied	S	2306018	c	Sulphide in soil	L010-PL	c
TPC15-1	None Supplied	S	2306018	c	Total cyanide in soil	L080-PL	c
TPC15-2	None Supplied	S	2306019	c	Sulphide in soil	L010-PL	c
TPC15-2	None Supplied	S	2306019	c	Total cyanide in soil	L080-PL	c
TPC15-3	None Supplied	S	2306020	c	Sulphide in soil	L010-PL	c
TPC15-3	None Supplied	S	2306020	c	Total cyanide in soil	L080-PL	c
TPC15-4	None Supplied	S	2306021	c	Sulphide in soil	L010-PL	c
TPC15-4	None Supplied	S	2306021	c	Total cyanide in soil	L080-PL	c
TPC15-5	None Supplied	S	2306022	c	Sulphide in soil	L010-PL	c
TPC15-5	None Supplied	S	2306022	c	Total cyanide in soil	L080-PL	c
TPD15-1	None Supplied	S	2306023	c	Sulphide in soil	L010-PL	c
TPD15-1	None Supplied	S	2306023	c	Total cyanide in soil	L080-PL	c
TPD15-2	None Supplied	S	2306024	c	Sulphide in soil	L010-PL	c
TPD15-2	None Supplied	S	2306024	c	Total cyanide in soil	L080-PL	c
TPD15-3	None Supplied	S	2306025	c	Sulphide in soil	L010-PL	c
TPD15-3	None Supplied	S	2306025	c	Total cyanide in soil	L080-PL	c
TPD15-4	None Supplied	S	2306026	c	Sulphide in soil	L010-PL	c
TPD15-4	None Supplied	S	2306026	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-63849

Project / Site name:	Stopes Road	**Samples received on:**	08/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	09/06/2022
Your order number:		**Analysis completed by:**	17/06/2022
Report Issue Number:	1	**Report issued on:**	17/06/2022
Samples Analysed:	20 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307695	2307696	2307697	2307698	2307699
Sample Reference				TPA16	TPA16	TPA16	TPA16	TPA16
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-2.80	2.80-3.40
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.2	13	13	15	22
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	Amosite	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.535	0.004	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.535	0.004	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	SCA	SCA
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.7	8.7	8.5	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	85	110	110	160	540
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.043	0.055	0.054	0.081	0.27
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	42.5	55.3	53.8	80.8	268
Total Potential Sulphate	mg/kg	30	NONE	1500	2100	1700	2400	3700
Sulphide	mg/kg	1	MCERTS	7.7	13	16	7.9	21
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	25	25	85
Total Sulphur	mg/kg	50	MCERTS	500	710	570	810	1200
Total Sulphur	%	0.005	MCERTS	0.05	0.071	0.057	0.081	0.123
Organic Matter (automated)	%	0.1	MCERTS	2.2	3.1	2.7	3.8	6.5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.013	0.018	0.015	0.022	0.038
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25	0.76	0.4
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.52	0.87	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.37	0.6	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.58	2.9	4.2	0.94
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.57	0.8	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.96	2.8	3.9	1.6
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1	2.5	3.5	1.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.74	1.5	2.2	1.1
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.57	1.2	1.7	1.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.79	1.2	1.8	1.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.26	0.64	0.77	0.47
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.59	1.1	1.6	0.87
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.3	0.52	0.8	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.22	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.38	0.64	0.97	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	6.21	16.6	24.6	9.29

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307695	2307696	2307697	2307698	2307699
Sample Reference				TPA16	TPA16	TPA16	TPA16	TPA16
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-2.80	2.80-3.40
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	31	25	32	45
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.9	1.5	1.3	1.6	3.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	1.4	1.2	1.5	2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	28	30	27	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	76	52	67	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	46	35	59	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	40	35	37	65
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	56	46	55	110
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	74	93	65	40
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	49	74	23	81	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	4.6	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	16	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	49	54	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	49	74	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	49	74	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	3.9	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	2.5	11	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	28	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	11	39	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	23	81	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	23	81	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307700	2307701	2307702	2307703	2307704
Sample Reference				TPA16	TPA15	TPA15	TPA15	TPA15
Sample Number				6	1	2	3	4
Depth (m)				3.40-4.00	0.10-0.20	0.20-1.30	2.60-3.30	3.30-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	7.1	16	19	9.8
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	SCA	SCA
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.3	10.4	8.5	7.8	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1500	500	730	600	420
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.74	0.25	0.36	0.3	0.21
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	736	248	365	299	210
Total Potential Sulphate	mg/kg	30	NONE	28000	2300	3900	5600	4400
Sulphide	mg/kg	1	MCERTS	51	6.5	6.7	62	82
Elemental Sulphur	mg/kg	5	MCERTS	130	< 5.0	10	51	120
Total Sulphur	mg/kg	50	MCERTS	9400	760	1300	1900	1500
Total Sulphur	%	0.005	MCERTS	0.938	0.076	0.131	0.185	0.148
Organic Matter (automated)	%	0.1	MCERTS	10	1.3	3.6	5.4	4
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.059	0.0077	0.021	0.031	0.023
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	4.5	< 0.05	0.33	0.65	1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.26	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.34	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.8	< 0.05	0.92	3.4	1.1
Anthracene	mg/kg	0.05	MCERTS	0.62	< 0.05	< 0.05	0.82	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.8	< 0.05	1.5	11	0.66
Pyrene	mg/kg	0.05	MCERTS	2.5	< 0.05	1.4	12	0.63
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	< 0.05	0.86	7.6	0.38
Chrysene	mg/kg	0.05	MCERTS	1.8	< 0.05	0.76	6.3	0.43
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.4	< 0.05	0.91	9.8	0.31
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.47	< 0.05	0.31	2.5	0.17
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.81	< 0.05	0.66	6.6	0.29
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.54	< 0.05	0.35	3.3	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.6	< 0.05	0.51	4.2	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	22.6	< 0.80	8.49	69.8	4.98

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307700	2307701	2307702	2307703	2307704
Sample Reference				TPA16	TPA15	TPA15	TPA15	TPA15
Sample Number				6	1	2	3	4
Depth (m)				3.40-4.00	0.10-0.20	0.20-1.30	2.60-3.30	3.30-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	58	23	38	29	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	0.98	1.7	3	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	1.3	3.4	0.6	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	29	28	32	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	87	35	82	110	48
Lead (aqua regia extractable)	mg/kg	1	MCERTS	49	19	48	32	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	30	48	95	43
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	37	52	120	86
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	58	63	47	90
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	27	< 10	< 10	82	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.4
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	11	< 2.0	< 2.0	7.1	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	11	< 10	< 10	33	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	42	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	27	< 10	< 10	82	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	27	< 10	< 10	82	< 10

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307705	2307706	2307707	2307708	2307709
Sample Reference				TPA14	TPA14	TPA14	TPA14	TPA14
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.40	3.40-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.5	9.2	13	14	13
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.7	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.4	8.2	7.7	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	71	110	260	410	480
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.036	0.053	0.13	0.2	0.24
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	35.6	52.9	131	204	239
Total Potential Sulphate	mg/kg	30	NONE	1000	2100	2900	4600	7000
Sulphide	mg/kg	1	MCERTS	13	92	170	92	81
Elemental Sulphur	mg/kg	5	MCERTS	10	13	< 5.0	51	67
Total Sulphur	mg/kg	50	MCERTS	340	700	950	1500	2300
Total Sulphur	%	0.005	MCERTS	0.034	0.07	0.095	0.155	0.235
Organic Matter (automated)	%	0.1	MCERTS	1.8	2.1	2	2.3	4.9
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.01	0.012	0.011	0.013	0.028
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.2
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.1
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	5.05

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307705	2307706	2307707	2307708	2307709
Sample Reference				TPA14	TPA14	TPA14	TPA14	TPA14
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.40	3.40-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	27	28	30	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	4.8	3.5	3.5	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	0.8	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	52	37	33	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	50	110	93	90	65
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	18	15	22	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	71	60	64	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	120	92	87	44
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	39	33	46	36
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	41	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	35	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	39	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	39	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.2
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307710	2307711	2307712	2307713	2307714
Sample Reference				TPA13	TPA13	TPA13	TPA13	TPA13
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.20	3.20-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	10	16	16	15	12
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.7	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW	JSW
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.2	8.4	7.4	6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	150	220	280	500	3500
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.077	0.11	0.14	0.25	1.8
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	76.6	108	141	251	1760
Total Potential Sulphate	mg/kg	30	NONE	1600	2400	4300	3100	26000
Sulphide	mg/kg	1	MCERTS	150	120	120	65	6.2
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	27	26	190
Total Sulphur	mg/kg	50	MCERTS	540	810	1400	1000	8800
Total Sulphur	%	0.005	MCERTS	0.054	0.081	0.142	0.103	0.881
Organic Matter (automated)	%	0.1	MCERTS	2.1	2.6	2.5	2.7	8.1
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.012	0.015	0.015	0.016	0.047
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.55	2.4
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.93	2.2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.71	0.69
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.71	0.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	2.9	6.2

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road

Lab Sample Number				2307710	2307711	2307712	2307713	2307714
Sample Reference				TPA13	TPA13	TPA13	TPA13	TPA13
Sample Number				1	2	3	4	5
Depth (m)				0.10-0.30	0.30-1.00	1.00-2.00	2.00-3.20	3.20-4.00
Date Sampled				06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	45	50	29	52
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.4	1.5	2.3	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.6	0.4	0.4	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	16	17	21	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	72	80	91	120
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.5	7.7	9.1	16	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	31	33	46	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	43	46	61	51
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	23	20	20	28	85
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	3.1
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-63849
Project / Site name: Stopes Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2307697	TPA16	1.00-2.00	157	Loose Fibrous Debris	**Amosite**	0.535	**0.535**
2307698	TPA16	2.00-2.80	155	Loose Fibrous Debris	**Amosite**	0.004	**0.004**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 22-63849
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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2307695	TPA16	1	0.10-0.30	Brown loam and clay with gravel and vegetation.
2307696	TPA16	2	0.30-1.00	Brown loam and clay with gravel and vegetation.
2307697	TPA16	3	1.00-2.00	Brown loam and clay with gravel and vegetation.
2307698	TPA16	4	2.00-2.80	Brown loam and clay with gravel and vegetation.
2307699	TPA16	5	2.80-3.40	Brown loam and clay with gravel and vegetation.
2307700	TPA16	6	3.40-4.00	Brown loam and clay with gravel and vegetation.
2307701	TPA15	1	0.10-0.20	Brown loam and clay with gravel and vegetation.
2307702	TPA15	2	0.20-1.30	Brown loam and clay with gravel and vegetation.
2307703	TPA15	3	2.60-3.30	Brown loam and clay with gravel and vegetation.
2307704	TPA15	4	3.30-4.00	Brown loam and clay with gravel and vegetation.
2307705	TPA14	1	0.10-0.30	Brown gravelly sand.
2307706	TPA14	2	0.30-1.00	Brown gravelly sand.
2307707	TPA14	3	1.00-2.00	Brown gravelly sand.
2307708	TPA14	4	2.00-3.40	Brown gravelly sand.
2307709	TPA14	5	3.40-4.00	Brown gravelly sand.
2307710	TPA13	1	0.10-0.30	Brown gravelly sand.
2307711	TPA13	2	0.30-1.00	Brown gravelly sand.
2307712	TPA13	3	1.00-2.00	Brown gravelly sand.
2307713	TPA13	4	2.00-3.20	Brown gravelly sand.
2307714	TPA13	5	3.20-4.00	Brown gravelly sand.

Analytical Report Number : 22-63849
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-63849
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-64224

Project / Site name:	Stopes Road	**Samples received on:**	10/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	10/06/2022
Your order number:		**Analysis completed by:**	17/06/2022
Report Issue Number:	1	**Report issued on:**	17/06/2022
Samples Analysed:	15 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-64224
Project / Site name: Stopes Road

Lab Sample Number				2309498	2309499	2309500	2309501	2309502
Sample Reference				HS216-C/1	HS216-C/2	HS216-N/1	HS216-N/2	HS216-E/1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	2.70	1.60	2.70	1.60
Date Sampled				08/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	13	13	14	15
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-64224
Project / Site name: Stopes Road

Lab Sample Number				2309503	2309504	2309505	2309506	2309507
Sample Reference				HS216-E/2	HS216-S/1	HS216-S/2	HS216-W/1	HS216-W/2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	1.60	2.70	1.50	2.70
Date Sampled				08/06/2022	08/06/2022	08/06/2022	08/06/2022	08/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	23	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	14	15	14	17
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	5
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	21	43
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	33	52
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	48	67
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	100	170
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	100	170
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	28	43
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	87	110
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	140	130
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	26	20
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	250	290
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	280	310

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Analytical Report Number: 22-64224
Project / Site name: Stopes Road

Lab Sample Number				2309508	2309509	2309510	2309511	2309512
Sample Reference				HS3-C	HS3-N	HS3-E	HS3-S	HS3-W
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				09/06/2022	09/06/2022	09/06/2022	09/06/2022	09/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	-	-	-
Moisture Content	%	0.01	NONE	-	-	-	-	-
Total mass of sample received	kg	0.001	NONE	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	SPU
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	-	-	-

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Analytical Report Number : 22-64224
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2309498	HS216-C/1	None Supplied	2.7	Brown loam and clay with gravel and vegetation.
2309499	HS216-C/2	None Supplied	2.7	Brown loam and clay with gravel and vegetation.
2309500	HS216-N/1	None Supplied	1.6	Brown loam and clay with gravel and vegetation.
2309501	HS216-N/2	None Supplied	2.7	Brown loam and clay with gravel and vegetation.
2309502	HS216-E/1	None Supplied	1.6	Brown sand with gravel.
2309503	HS216-E/2	None Supplied	2.7	Brown sand with gravel and stones.
2309504	HS216-S/1	None Supplied	1.6	Brown sand with gravel.
2309505	HS216-S/2	None Supplied	2.7	Light brown clay and sand with gravel.
2309506	HS216-W/1	None Supplied	1.5	Brown loam and clay with gravel and vegetation.
2309507	HS216-W/2	None Supplied	2.7	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 22-64224
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-66117

Project / Site name:	Stopes Road	**Samples received on:**	20/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	20/06/2022
Your order number:		**Analysis completed by:**	28/06/2022
Report Issue Number:	1	**Report issued on:**	28/06/2022
Samples Analysed:	4 soil samples		

Martyna Langer

Signed:

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-66117
Project / Site name: Stopes Road

Lab Sample Number				2320566	2320567	2320568	2320569
Sample Reference				STC6-1	STE6-1	TPE7-1	TPF7-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-1.50	0.00-1.10	0.50-1.50	0.40-1.20
Date Sampled				17/06/2022	17/06/2022	17/06/2022	17/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	17	46	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	10	8.5	25	6
Total mass of sample received	kg	0.001	NONE	0.6	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.2	9.7	8.4	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1100	1100	760	280
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.57	0.55	0.38	0.14
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	574	551	378	139
Total Potential Sulphate	mg/kg	30	NONE	2600	3000	3600	1200
Sulphide	mg/kg	1	MCERTS	32	67	100	27
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	19	160	14
Total Sulphur	mg/kg	50	MCERTS	850	1000	1200	410
Total Sulphur	%	0.005	MCERTS	0.085	0.1	0.122	0.041
Organic Matter (automated)	%	0.1	MCERTS	1	1.2	2.7	2
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0055	0.0071	0.016	0.012

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.76	0.84	< 0.05	0.54
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.1	0.91	< 0.05	0.53
Pyrene	mg/kg	0.05	MCERTS	0.97	0.79	< 0.05	0.45
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.49	0.4	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.48	0.38	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.41	0.25	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.31	0.33	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.48	0.33	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.97	4.23	< 0.80	1.79

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Analytical Report Number: 22-66117
Project / Site name: Stopes Road

Lab Sample Number				2320566	2320567	2320568	2320569
Sample Reference				STC6-1	STE6-1	TPE7-1	TPF7-1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-1.50	0.00-1.10	0.50-1.50	0.40-1.20
Date Sampled				17/06/2022	17/06/2022	17/06/2022	17/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	8.3	65	34
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.85	0.35	2	3.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.9	1.9	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	6.4	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	11	28	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	16	61	78
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	19	35	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	8.8	50	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40	14	83	91
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	65	69	47
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	31	140	< 10	14
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	9.1	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	19	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	49	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	17	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	77	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	94	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	17	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	23	34	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	31	51	< 10	14
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	31	51	< 10	14

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-66117
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2320566	STC6-1	None Supplied	0.30-1.50	Brown sandy loam with stones and gravel
2320567	STE6-1	None Supplied	0.00-1.10	Brown sandy loam with stones and gravel
2320568	TPE7-1	None Supplied	0.50-1.50	Black sandy clay.
2320569	TPF7-1	None Supplied	0.40-1.20	Brown sand with gravel.

Analytical Report Number : 22-66117
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-66117
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-66969

Project / Site name:	Stopes Road	**Samples received on:**	22/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	23/06/2022
Your order number:		**Analysis completed by:**	04/07/2022
Report Issue Number:	1	**Report issued on:**	04/07/2022
Samples Analysed:	4 soil samples		

Signed: Martyna Langer

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Application of uncertainty of measurement would provide a range within which the true result lies.
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Analytical Report Number: 22-66969
Project / Site name: Stopes Road

Lab Sample Number				2325416	2325417	2325418	2325419
Sample Reference				TP6F-E1	TP6G-E2	TP7F-E2	TP7G-E1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.00	1.10	0.50
Date Sampled				20/06/2022	20/06/2022	20/06/2022	20/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	15	< 0.1	< 0.1	6.5
Moisture Content	%	0.01	NONE	2.7	22	19	1.7
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	MJN

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	7.2	7.6	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	220	450	2800	64
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.22	1.4	0.032
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	111	223	1390	31.8
Total Potential Sulphate	mg/kg	30	NONE	2200	3100	11000	1500
Sulphide	mg/kg	1	MCERTS	120	39	97	37
Elemental Sulphur	mg/kg	5	MCERTS	20	150	350	13
Total Sulphur	mg/kg	50	MCERTS	740	1000	3700	500
Total Sulphur	%	0.005	MCERTS	0.074	0.104	0.365	0.05
Organic Matter (automated)	%	0.1	MCERTS	1.3	8.8	3.5	0.5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0074	0.051	0.021	0.003

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.25	0.49	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.3	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.7	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	2.5	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.7	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.1	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.85	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.98	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	16.3	< 0.80	< 0.80

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Analytical Report Number: 22-66969
Project / Site name: Stopes Road

Lab Sample Number				2325416	2325417	2325418	2325419
Sample Reference				TP6F-E1	TP6G-E2	TP7F-E2	TP7G-E1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.00	1.10	0.50
Date Sampled				20/06/2022	20/06/2022	20/06/2022	20/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	43	38	4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.26	1.3	1.3	0.31
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.6	1.5	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.1	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	U/S*	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	37	22	9.1
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	54	53	5.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	210	24	6.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.2	21	32	8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	12	37	41	8.1
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	150	42	12
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

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Analytical Report Number: 22-66969
Project / Site name: Stopes Road

Lab Sample Number				2325416	2325417	2325418	2325419
Sample Reference				TP6F-E1	TP6G-E2	TP7F-E2	TP7G-E1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.00	1.10	0.50
Date Sampled				20/06/2022	20/06/2022	20/06/2022	20/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Petroleum Hydrocarbons							
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	180	100	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	43	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	20	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	43	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	63	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	7.6	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	19	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	73	70	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	76	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	78	96	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	150	96	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample
*Analysis could not be completed due to sample matrix.

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Analytical Report Number : 22-66969
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2325416	TP6F-E1	None Supplied	0.4	Brown sand with rubble and vegetation.
2325417	TP6G-E2	None Supplied	1	Brown clay and loam with gravel and vegetation.
2325418	TP7F-E2	None Supplied	1.1	Grey clay and sand with gravel.
2325419	TP7G-E1	None Supplied	0.5	Brown sand with rubble.

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Analytical Report Number : 22-66969
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

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Analytical Report Number : 22-66969
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 22-66969
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-68571

Replaces Analytical Report Number: 22-68571, issue no. 1
Client references/information amended.

Project / Site name:	Stopes Road	**Samples received on:**	30/06/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	30/06/2022
Your order number:		**Analysis completed by:**	14/07/2022
Report Issue Number:	2	**Report issued on:**	14/07/2022
Samples Analysed:	5 soil samples		

Signed:

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-68571
Project / Site name: Stopes Road

Lab Sample Number				2334440	2334441	2334442	2334443	2334444
Sample Reference				TPC8-1	TPC11-1	HS3-D-1	HS3-D-2	HS3-D-3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.50	None Supplied	None Supplied	None Supplied
Date Sampled				23/06/2022	23/06/2022	28/06/2022	28/06/2022	28/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Moisture Content	%	0.01	NONE	3.3	8.3	5.7	-	-
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.5	-	-

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	< 0.001
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	SCA	SCA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.5	8.9	8.7	-	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	710	140	340	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.35	0.072	0.17	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	353	71.9	170	-	-
Total Potential Sulphate	mg/kg	30	NONE	2400	2400	2400	-	-
Sulphide	mg/kg	1	MCERTS	36	58	47	-	-
Elemental Sulphur	mg/kg	5	MCERTS	26	44	34	-	-
Total Sulphur	mg/kg	50	MCERTS	780	800	810	-	-
Total Sulphur	%	0.005	MCERTS	0.078	0.08	0.081	-	-
Organic Matter (automated)	%	0.1	MCERTS	1.4	2.6	2.2	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0078	0.015	0.013	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.24	0.18	< 0.05	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.19	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	2.4	3.8	0.96	-	-
Anthracene	mg/kg	0.05	MCERTS	0.47	0.71	0.22	-	-
Fluoranthene	mg/kg	0.05	MCERTS	3.2	8	1.1	-	-
Pyrene	mg/kg	0.05	MCERTS	3	7.3	0.97	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.6	4.6	0.56	-	-
Chrysene	mg/kg	0.05	MCERTS	1.3	3.1	0.62	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.4	3.8	0.68	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.85	2.1	0.33	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.7	4.3	0.65	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.51	1.5	0.26	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.42	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.65	1.9	0.34	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	17.2	42.3	6.65	-	-

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Analytical Report Number: 22-68571
Project / Site name: Stopes Road

Lab Sample Number				2334440	2334441	2334442	2334443	2334444
Sample Reference				TPC8-1	TPC11-1	HS3-D-1	HS3-D-2	HS3-D-3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.50	None Supplied	None Supplied	None Supplied
Date Sampled				23/06/2022	23/06/2022	28/06/2022	28/06/2022	28/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	32	30	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.95	2.2	1.5	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	0.5	1.5	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	< 0.2	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	30	29	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45	76	70	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	52	35	44	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	43	35	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	64	58	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93	68	81	-	-
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	50	69	99	-	-
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	6.7	8.6	8.4	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	12	17	14	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	31	36	54	-	-
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	32	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	50	61	76	-	-
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	50	61	110	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-68571
Project / Site name: Stopes Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2334440	TPC8-1	0.60	168	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
2334444	HS3-D-3		165	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 22-68571
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2334440	TPC8-1	None Supplied	0.6	Brown sand with gravel.
2334441	TPC11-1	None Supplied	1.5	Brown loam and clay with gravel and vegetation.
2334442	HS3-D-1	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 22-68571
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-68571
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-68571
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TPC11-1	None Supplied	S	2334441	c	Sulphide in soil	L010-PL	c
TPC11-1	None Supplied	S	2334441	c	Total cyanide in soil	L080-PL	c
TPC8-1	None Supplied	S	2334440	c	Sulphide in soil	L010-PL	c
TPC8-1	None Supplied	S	2334440	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-69704

Project / Site name:	Stopes Road	**Samples received on:**	06/07/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	06/07/2022
Your order number:		**Analysis completed by:**	14/07/2022
Report Issue Number:	1	**Report issued on:**	14/07/2022
Samples Analysed:	1 soil sample - 3 water samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-69704
Project / Site name: Stopes Road

Lab Sample Number				2340374
Sample Reference				Fuel Tank 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				05/07/2022
Time Taken				1500
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	16
Moisture Content	%	0.01	NONE	18
Total mass of sample received	kg	0.001	NONE	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MLO
General Inorganics				
pH - Automated	pH Units	N/A	MCERTS	10.6
Speciated PAHs				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05
Total PAH				
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.6
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	4.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	8.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	19

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Analytical Report Number: 22-69704
Project / Site name: Stopes Road

Lab Sample Number				2340374
Sample Reference				Fuel Tank 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				05/07/2022
Time Taken				1500
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-69704
Project / Site name: Stopes Road

Lab Sample Number				2340371	2340372	2340373
Sample Reference				IBC-1	IBC-2	Fuel Tank 2
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2022	05/07/2022	05/07/2022
Time Taken				1200	1210	1620
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
General Inorganics						
pH	pH Units	N/A	ISO 17025	7.9	7.2	7.5
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	4100	4600	4600
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10
Thiocyanate as SCN	µg/l	200	ISO 17025	360	280	U/S*
Sulphate as SO4	mg/l	0.045	ISO 17025	8.46	8.3	U/S*
Elemental Sulphur	mg/l	0.02	NONE	< 0.02	< 0.02	< 0.02
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	U/S*
Chloride	mg/l	0.15	ISO 17025	48	48	U/S*
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	6900	7600	U/S*
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	85.7	113	U/S*
Total Suspended Solids	mg/l	2	ISO 17025	8	140	810
Phenols by HPLC						
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5
Total Phenols						
Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5

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Analytical Report Number: 22-69704
Project / Site name: Stopes Road

Lab Sample Number				2340371	2340372	2340373
Sample Reference				IBC-1	IBC-2	Fuel Tank 2
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2022	05/07/2022	05/07/2022
Time Taken				1200	1210	1620
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Speciated PAHs						
Naphthalene	µg/l	0.01	ISO 17025	701	< 0.01	11900
Acenaphthylene	µg/l	0.01	ISO 17025	0.56	< 0.01	1610
Acenaphthene	µg/l	0.01	ISO 17025	3.11	< 0.01	2460
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	9450
Phenanthrene	µg/l	0.01	ISO 17025	1.08	20	15000
Anthracene	µg/l	0.01	ISO 17025	0.52	< 0.01	1700
Fluoranthene	µg/l	0.01	ISO 17025	0.83	< 0.01	1340
Pyrene	µg/l	0.01	ISO 17025	1.03	< 0.01	2160
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0.75	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	0.27	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Total PAH						
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	709	20	45600
Heavy Metals / Metalloids						
Iron (dissolved)	mg/l	0.004	ISO 17025	0.008	0.16	U/S*
Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.92	3.06	U/S*
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.06	U/S*
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.3	U/S*
Copper (dissolved)	µg/l	0.5	ISO 17025	9.9	7.9	U/S*
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	3.3	U/S*
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	U/S*
Nickel (dissolved)	µg/l	0.5	ISO 17025	120	85	U/S*
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.9	0.9	U/S*
Zinc (dissolved)	µg/l	0.5	ISO 17025	190	310	U/S*
Monoaromatics & Oxygenates						
Benzene	µg/l	1	ISO 17025	17	5.8	19.5
Toluene	µg/l	1	ISO 17025	149	11.5	420
Ethylbenzene	µg/l	1	ISO 17025	73.8	34.8	173
p & m-xylene	µg/l	1	ISO 17025	242	147	1300
o-xylene	µg/l	1	ISO 17025	213	93.5	815
Petroleum Hydrocarbons						
TPH1 (C10 - C40) EH_2D_TOTAL_#1_#2	µg/l	10	ISO 17025	4700	240000	16000000**

U/S = Unsuitable Sample I/S = Insufficient Sample

* Sample was oliy.

**Over range data, sample was diluted and results are estimated from an extrapolated calibration. Results should be interpreted with care.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-69704
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2340374	Fuel Tank 1	None Supplied	None Supplied	Light brown sand with gravel and stones.

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Analytical Report Number : 22-69704
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L005-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Thiocyanate in water	Determination of thiocyanate in water by discreet analyser (colorimetry). Accredited matrices SW, GW, PW.	In house method based on SMWW 4500-CN-M. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

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Analytical Report Number : 22-69704
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in water (Monoaromatics)	Determination of BTEX in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Elemental sulphur in water	Determination of elemental sulphur in water by extraction in dichloromethane followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-69704
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-72007

Project / Site name:	Stopes Road	**Samples received on:**	18/07/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	18/07/2022
Your order number:		**Analysis completed by:**	26/07/2022
Report Issue Number:	1	**Report issued on:**	26/07/2022
Samples Analysed:	5 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-72007
Project / Site name: Stopes Road

Lab Sample Number				2354106	2354107	2354108	2354109	2354110
Sample Reference				HSC13-N	HSC13-E	HSC13-S	HSC13-W	HSC13-B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.9	5.3	5.3	7.8	6.8
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.9	0.9	0.8
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	7.1	< 2.0	< 2.0	7.1
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	17	20	< 8.0	< 8.0	30
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	86	150	61	< 8.0	190
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	49	67	28	< 8.4	61
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	100	170	61	< 10	230
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	150	240	89	< 10	290
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	13	< 1.0	< 1.0	3.1
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	4.4	11	< 2.0	< 2.0	19
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	68	82	12	14	190
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	200	350	56	70	800
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	54	87	37	21	120
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	270	450	68	84	1000
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	320	540	100	110	1100

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-72007
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2354106	HSC13-N	None Supplied	None Supplied	Brown sand with brick and rubble.
2354107	HSC13-E	None Supplied	None Supplied	Brown sand with gravel and clinker
2354108	HSC13-S	None Supplied	None Supplied	Brown sand with gravel and clinker
2354109	HSC13-W	None Supplied	None Supplied	Brown sand with clinker.
2354110	HSC13-B	None Supplied	None Supplied	Brown sand with gravel and clinker

Analytical Report Number : 22-72007
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-75377

Project / Site name:	Stopes Road	**Samples received on:**	02/08/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	02/08/2022
Your order number:		**Analysis completed by:**	09/08/2022
Report Issue Number:	1	**Report issued on:**	09/08/2022
Samples Analysed:	3 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-75377
Project / Site name: Stopes Road

Lab Sample Number				2373953	2373954	2373955
Sample Reference				HS4-C13-1	HS4-C13-2	HS4-C13-3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2022	02/08/2022	02/08/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	17	15
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	4.6	3.1	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	19	13	19
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	36	28	37
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	59	44	56
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	59	44	66

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-75377
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2373953	HS4-C13-1	None Supplied	None Supplied	Brown gravelly sand.
2373954	HS4-C13-2	None Supplied	None Supplied	Brown gravelly sand.
2373955	HS4-C13-3	None Supplied	None Supplied	Brown gravelly sand.

Analytical Report Number : 22-75377
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-75379

Project / Site name:	Stopes Road	**Samples received on:**	02/08/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	02/08/2022
Your order number:		**Analysis completed by:**	09/08/2022
Report Issue Number:	1	**Report issued on:**	09/08/2022
Samples Analysed:	1 soil sample		

Signed:

Anna Goc
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Application of uncertainty of measurement would provide a range within which the true result lies.
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Analytical Report Number: 22-75379
Project / Site name: Stopes Road

Lab Sample Number				2373962
Sample Reference				HS5-F15 Spill 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/08/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	8.5
Total mass of sample received	kg	0.001	NONE	0.4

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	4.8
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	34
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	890
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	730
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	930
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	1700

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	4
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	200
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	880
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	220
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	1100

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Analytical Report Number : 22-75379
Project / Site name: Stopes Road

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2373962	HS5-F15 Spill 1	None Supplied	None Supplied	Brown clay and gravel.

Analytical Report Number : 22-75379
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-75380

Project / Site name:	Stopes Road	**Samples received on:**	02/08/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	02/08/2022
Your order number:		**Analysis completed by:**	09/08/2022
Report Issue Number:	1	**Report issued on:**	09/08/2022
Samples Analysed:	3 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
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Analytical Report Number: 22-75380
Project / Site name: Stopes Road

Lab Sample Number				2373963	2373964	2373965
Sample Reference				HS-HYD-1	HS-HYD-2	HS-HYD-3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				02/08/2022	02/08/2022	02/08/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	16	16
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	29	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	85	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	93	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	130	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	210	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	340	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	1
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	21	14	11
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	57	47	26
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	100	68	45
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	430	310	340
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	180	130	83
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	610	440	430

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Analytical Report Number : 22-75380
Project / Site name: Stopes Road

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2373963	HS-HYD-1	None Supplied	None Supplied	Brown clay and gravel.
2373964	HS-HYD-2	None Supplied	None Supplied	Brown clay and gravel.
2373965	HS-HYD-3	None Supplied	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 22-75380
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

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HS	Headspace Analysis
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FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-75381

Project / Site name:	Stopes Road	**Samples received on:**	02/08/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	02/08/2022
Your order number:		**Analysis completed by:**	10/08/2022
Report Issue Number:	1	**Report issued on:**	10/08/2022
Samples Analysed:	1 soil sample		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-75381
Project / Site name: Stopes Road

Lab Sample Number				2373966
Sample Reference				HS-Fuel Tank 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/08/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	18
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	LFT

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.2

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.2
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	49
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	8.9
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	22

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Analytical Report Number: 22-75381
Project / Site name: Stopes Road

Lab Sample Number				2373966
Sample Reference				HS-Fuel Tank 1
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/08/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	8.3
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	23
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	12
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	43
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	43
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-75381
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2373966	HS-Fuel Tank 1	None Supplied	None Supplied	Brown sand with gravel.

Analytical Report Number : 22-75381
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-75381
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-78624

Project / Site name:	Stopes Road	**Samples received on:**	17/08/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	17/08/2022
Your order number:		**Analysis completed by:**	29/08/2022
Report Issue Number:	1	**Report issued on:**	29/08/2022
Samples Analysed:	2 soil samples		

Signed:

Martyna Langer
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-78624
Project / Site name: Stopes Road

Lab Sample Number				2392020	2392021
Sample Reference				TPD19 Yellow Gravel 1	TPD19 Black Cobble 1
Sample Number				None Supplied	None Supplied
Depth (m)				0.30	2.00
Date Sampled				15/08/2022	15/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	2.2	21
Total mass of sample received	kg	0.001	NONE	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	740
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.37
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.1	372
Total Potential Sulphate	mg/kg	30	NONE	320	3200
Sulphide	mg/kg	1	MCERTS	< 1.0	9.8
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	110	1100
Total Sulphur	%	0.005	MCERTS	0.011	0.108
Organic Matter (automated)	%	0.1	MCERTS	0.7	5.1
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0042	0.03

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.3
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	3.5
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.61
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	4.2
Pyrene	mg/kg	0.05	MCERTS	< 0.05	3.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.2
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.85
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.92
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	23.2

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Analytical Report Number: 22-78624
Project / Site name: Stopes Road

Lab Sample Number				2392020	2392021
Sample Reference				TPD19 Yellow Gravel 1	TPD19 Black Cobble 1
Sample Number				None Supplied	None Supplied
Depth (m)				0.30	2.00
Date Sampled				15/08/2022	15/08/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5	33
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.61	2.8
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	4.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	39
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	140
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.5	43
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	73
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	89
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	43	58
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0
Petroleum Hydrocarbons					
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	28
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	13
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	15
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	28
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	28

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-78624
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2392020	D19 Yellow Grav	None Supplied	0.3	Brown sandy loam with gravel.
2392021	D19 Black Cobbl	None Supplied	2	Brown sand with gravel.

Analytical Report Number : 22-78624
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-78624
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-83661

Project / Site name:	Stopes Road	**Samples received on:**	12/09/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	12/09/2022
Your order number:		**Analysis completed by:**	21/09/2022
Report Issue Number:	1	**Report issued on:**	21/09/2022
Samples Analysed:	8 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-83661
Project / Site name: Stopes Road

Lab Sample Number				2422173	2422174	2422175	2422176	2422177
Sample Reference				HS7-SPB11-1	HS7-SPB11-2	HS7-SPB11-3	HS7-N	HS7-E
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/09/2022	12/09/2022	12/09/2022	12/09/2022	12/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	18	17	21	15
Total mass of sample received	kg	0.001	NONE	0.4	0.8	0.8	0.8	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile & Crocidolite	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.007	0.069	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.007	0.069	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	ASE	ASE	ASE	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	7.8	U/S	7.7	8.0
Total Cyanide	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	910	89
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.46	0.045
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	455	44.5
Total Potential Sulphate	mg/kg	30	NONE	-	-	-	3800	410
Sulphide	mg/kg	1	MCERTS	-	-	-	6.7	< 1.0
Elemental Sulphur	mg/kg	5	MCERTS	-	-	-	140	6.5
Total Sulphur	mg/kg	50	MCERTS	-	-	-	1300	140
Total Sulphur	%	0.005	MCERTS	-	-	-	0.128	0.014
Organic Matter (automated)	%	0.1	MCERTS	-	-	-	5.3	2
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	-	-	0.031	0.012

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	U/S	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	U/S	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	2.4	U/S	0.45	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	3.6	U/S	0.64	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	68	U/S	20	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	17	U/S	4.6	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	120	U/S	41	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	98	U/S	36	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	65	U/S	19	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	43	U/S	14	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	57	U/S	17	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	18	U/S	6.5	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	52	U/S	16	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	20	U/S	7.7	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	5.6	U/S	2.2	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	23	U/S	8.5	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	590	< 0.80	195	< 0.80

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-83661
Project / Site name: Stopes Road

Lab Sample Number				2422173	2422174	2422175	2422176	2422177
Sample Reference				HS7-SPB11-1	HS7-SPB11-2	HS7-SPB11-3	HS7-N	HS7-E
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/09/2022	12/09/2022	12/09/2022	12/09/2022	12/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	29	U/S	20	5.5
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.3	U/S	1.4	0.54
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2.2	U/S	0.6	1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	U/S	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	19	U/S	22	6.5
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	68	U/S	65	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	85	U/S	72	6.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	U/S	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	27	U/S	40	7.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	U/S	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	37	U/S	45	12
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	92	U/S	83	22
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	-	-	-	260	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	2	< 1.0	U/S	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	29	13	U/S	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	96	74	U/S	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	550	390	U/S	13	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	280	210	U/S	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	680	480	U/S	13	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	960	690	U/S	13	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	12	< 1.0	U/S	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	43	9.8	U/S	13	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	600	190	U/S	59	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	1200	620	U/S	130	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	200	130	U/S	72	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	1800	820	U/S	200	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	2000	940	U/S	270	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-83661
Project / Site name: Stopes Road

Lab Sample Number				2422178	2422179	2422180
Sample Reference				HS7-S	HS7-W	HS7-B
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				12/09/2022	12/09/2022	12/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	18	14
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.001	-
Asbestos Analyst ID	N/A	N/A	N/A	ASE	ASE	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	8.1	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	250	390	190
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13	0.2	0.095
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	127	195	95.4
Total Potential Sulphate	mg/kg	30	NONE	1300	3100	640
Sulphide	mg/kg	1	MCERTS	4.5	8.7	3.8
Elemental Sulphur	mg/kg	5	MCERTS	24	56	26
Total Sulphur	mg/kg	50	MCERTS	450	1000	210
Total Sulphur	%	0.005	MCERTS	0.045	0.105	0.021
Organic Matter (automated)	%	0.1	MCERTS	4.5	6.4	1.5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.026	0.037	0.0087

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.29	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.27	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.83	2.9	1
Anthracene	mg/kg	0.05	MCERTS	0.19	0.8	0.31
Fluoranthene	mg/kg	0.05	MCERTS	1.6	5.7	1.5
Pyrene	mg/kg	0.05	MCERTS	1.4	5.2	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.64	3.1	0.71
Chrysene	mg/kg	0.05	MCERTS	0.68	2.3	0.59
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.55	2.7	0.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.29	1.5	0.36
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.55	2.9	0.66
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.5	0.35
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.44	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.35

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.7	31.3	7.78

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Analytical Report Number: 22-83661
Project / Site name: Stopes Road

Lab Sample Number				2422178	2422179	2422180
Sample Reference				HS7-S	HS7-W	HS7-B
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				12/09/2022	12/09/2022	12/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7	21	8.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.73	1	0.67
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	2.4	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	12	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	54	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	43	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	29	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.2	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	24	16
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	86	38
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	< 10	150	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	42	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	20	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	42	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	62	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	15	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	57	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	31	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	72	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	100	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-83661
Project / Site name: Stopes Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2422174	HS7-SPB11-2		143	Loose Fibrous Debris	**Chrysotile & Crocidolite**	0.007	**0.007**
2422175	HS7-SPB11-3		144	Loose Fibrous Debris	**Chrysotile**	0.069	**0.069**
2422179	HS7-W		139	Loose Fibrous Debris	**Chrysotile**	0.001	**0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 22-83661
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2422173	HS7-SPB11-1	None Supplied	None Supplied	Brown silt with gravel.
2422174	HS7-SPB11-2	None Supplied	None Supplied	Brown silt with gravel.
2422175	HS7-SPB11-3	None Supplied	None Supplied	Brown silt with gravel.
2422176	HS7-N	None Supplied	None Supplied	Brown silt with gravel.
2422177	HS7-E	None Supplied	None Supplied	Brown sand with gravel.
2422178	HS7-S	None Supplied	None Supplied	Brown sand with gravel.
2422179	HS7-W	None Supplied	None Supplied	Brown clay and sand with gravel.
2422180	HS7-B	None Supplied	None Supplied	Brown sand with gravel.

Analytical Report Number : 22-83661
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-83661
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-86075

Project / Site name:	Stopes Road	**Samples received on:**	23/09/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	23/09/2022
Your order number:		**Analysis completed by:**	03/10/2022
Report Issue Number:	1	**Report issued on:**	03/10/2022
Samples Analysed:	9 soil samples		

Signed:

Anna Goc
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-86075
Project / Site name: Stopes Road

Lab Sample Number				2435798	2435799	2435800	2435801	2435802
Sample Reference				Post-HS5-1	Post-HS5-2	Post-HS5-B	Post-HS6-1	Post-HS6-2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/09/2022	22/09/2022	22/09/2022	22/09/2022	22/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	14	15	13	12
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW	JSW
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.2	8.2	7.7	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	760	760	850	2100	1400
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.38	0.38	0.42	1	0.71
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	379	378	425	1040	707
Total Potential Sulphate	mg/kg	30	NONE	4800	4500	4500	7200	6800
Sulphide	mg/kg	1	MCERTS	22	28	11	22	24
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	24	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1600	1500	1500	2400	2300
Total Sulphur	%	0.005	MCERTS	0.159	0.149	0.15	0.241	0.227
Organic Matter (automated)	%	0.1	MCERTS	4.2	3.8	3.4	5.7	4.4
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.025	0.022	0.02	0.033	0.026
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	23	7.7
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.66	< 0.05	1.8	2.5
Acenaphthylene	mg/kg	0.05	MCERTS	0.26	0.44	< 0.05	1.5	1.6
Acenaphthene	mg/kg	0.05	MCERTS	0.52	0.62	0.22	1.5	2.1
Fluorene	mg/kg	0.05	MCERTS	0.57	1	0.36	2.6	3
Phenanthrene	mg/kg	0.05	MCERTS	6.5	11	4	25	30
Anthracene	mg/kg	0.05	MCERTS	1.9	2.6	0.96	5.7	7.2
Fluoranthene	mg/kg	0.05	MCERTS	12	18	7.2	43	47
Pyrene	mg/kg	0.05	MCERTS	11	15	6.6	39	41
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.9	9	3.6	19	22
Chrysene	mg/kg	0.05	MCERTS	5.7	6.2	3.2	19	22
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.8	5.9	3	19	23
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.5	4.6	1.9	7.4	7.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.9	6.4	2.6	15	17
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.8	3.3	1.6	7.9	7.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.66	0.93	0.35	2.3	2.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.8	4.1	2.1	8.8	9.5
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	68.4	90	37.7	219	245

Analytical Report Number: 22-86075
Project / Site name: Stopes Road

Lab Sample Number				2435798	2435799	2435800	2435801	2435802
Sample Reference				Post-HS5-1	Post-HS5-2	Post-HS5-B	Post-HS6-1	Post-HS6-2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/09/2022	22/09/2022	22/09/2022	22/09/2022	22/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	54	43	55	45	56
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.5	2	2.4	2.4	4
Boron (water soluble)	mg/kg	0.2	MCERTS	4.6	5.8	4.9	9.1	7.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	30	28	29	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	68	96	87	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	54	60	68	97
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	67	42	52	52	67
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	91	66	72	68	100
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	110	77	120	110
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	340	250	230	760	820
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	5.7	12	7.4	6.3	5.1
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	14	19	13	13	13
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	58	66	50	67	66
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	36	27	20	21	16
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	77	97	70	86	84
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	110	120	91	110	100
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	5.8	< 2.0	< 2.0	23	28
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	53	39	33	180	210
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	140	82	85	380	430
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	96	39	44	110	78
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	200	120	120	590	670
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	290	160	160	700	750

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-86075
Project / Site name: Stopes Road

Lab Sample Number				2435803	2435804	2435805	2435806
Sample Reference				Post-HS6-B	Post-HS8-1	Post-HS8-2	Post-HS8-B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/09/2022	22/09/2022	22/09/2022	22/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	11	12	11
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite	Chrysotile & Amosite & Crocidolite	Chrysotile & Amosite	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	0.308	0.436	0.014
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	0.308	0.436	0.014
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.5	8.4	9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	1.2	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	740	910	990	720
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.37	0.46	0.49	0.36
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	370	456	495	360
Total Potential Sulphate	mg/kg	30	NONE	5600	6900	7700	5900
Sulphide	mg/kg	1	MCERTS	34	27	21	< 1.0
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1900	2300	2600	2000
Total Sulphur	%	0.005	MCERTS	0.187	0.229	0.256	0.197
Organic Matter (automated)	%	0.1	MCERTS	3.5	8.7	8.7	5.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.02	0.05	0.05	0.031

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	1.2	36	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.6	8.8	6.2	3.8
Acenaphthylene	mg/kg	0.05	MCERTS	1.6	2.8	2.2	1.4
Acenaphthene	mg/kg	0.05	MCERTS	1.3	20	16	6.5
Fluorene	mg/kg	0.05	MCERTS	2.8	18	17	7
Phenanthrene	mg/kg	0.05	MCERTS	28	210	190	67
Anthracene	mg/kg	0.05	MCERTS	7.5	50	46	17
Fluoranthene	mg/kg	0.05	MCERTS	44	330	300	81
Pyrene	mg/kg	0.05	MCERTS	38	290	260	80
Benzo(a)anthracene	mg/kg	0.05	MCERTS	20	150	130	52
Chrysene	mg/kg	0.05	MCERTS	19	130	130	46
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	14	160	140	56
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	13	30	41	12
Benzo(a)pyrene	mg/kg	0.05	MCERTS	17	110	110	41
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	7.9	57	53	19
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.1	< 0.05	< 0.05	5.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	10	67	64	23

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	228	1630	1510	518

Analytical Report Number: 22-86075
Project / Site name: Stopes Road

Lab Sample Number				2435803	2435804	2435805	2435806
Sample Reference				Post-HS6-B	Post-HS8-1	Post-HS8-2	Post-HS8-B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/09/2022	22/09/2022	22/09/2022	22/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	53	34	33	35
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.8	1.7	1.5	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	5.5	4.3	2.6	3.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	24	23	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	72	75	74
Lead (aqua regia extractable)	mg/kg	1	MCERTS	97	69	68	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	59	52	40	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	79	45	45	46
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	98	110	91
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	420	6300	6000	1900
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	20	18	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	2.5	66	58	19
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	8.4	140	130	53
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	42	600	540	240
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	240	210	84
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	53	830	740	310
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	53	1100	950	390
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	13	8.7	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	13	150	140	49
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	83	1600	1500	440
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	220	3200	2900	940
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	79	520	740	270
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	310	5000	4600	1400
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	390	5500	5300	1700

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: **22-86075**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2435802	Post-HS6-2		140	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
2435803	Post-HS6-B		142	Loose Fibres	**Amosite**	< 0.001	**< 0.001**
2435804	Post-HS8-1		140	Hard/Cement Type Material & Loose Fibrous Debris & Loose Fibres	**Chrysotile & Amosite & Crocidolite**	0.308	**0.308**
2435805	Post-HS8-2		136	Hard/Cement Type Material & Loose Fibrous Debris & Loose Fibres	**Chrysotile & Amosite**	0.436	**0.436**
2435806	Post-HS8-B		135	Loose Fibrous Debris & Loose Fibres	**Chrysotile & Amosite**	0.014	**0.014**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 22-86075
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2435798	Post-HS5-1	None Supplied	None Supplied	Black gravelly sand.
2435799	Post-HS5-2	None Supplied	None Supplied	Grey clay and sand with gravel.
2435800	Post-HS5-B	None Supplied	None Supplied	Grey clay and sand with gravel.
2435801	Post-HS6-1	None Supplied	None Supplied	Grey clay and sand with gravel.
2435802	Post-HS6-2	None Supplied	None Supplied	Grey clay and sand with gravel.
2435803	Post-HS6-B	None Supplied	None Supplied	Grey clay and sand with gravel and vegetation.
2435804	Post-HS8-1	None Supplied	None Supplied	Grey clay and sand with gravel.
2435805	Post-HS8-2	None Supplied	None Supplied	Grey clay and sand with gravel.
2435806	Post-HS8-B	None Supplied	None Supplied	Grey clay and sand with gravel.

Analytical Report Number : 22-86075
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-86075
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 22-86075
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-87588

Project / Site name:	Stopes Road	**Samples received on:**	30/09/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	30/09/2022
Your order number:		**Analysis completed by:**	07/10/2022
Report Issue Number:	1	**Report issued on:**	07/10/2022
Samples Analysed:	6 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445513	2445514	2445515	2445516	2445517
Sample Reference				Preclass-1.50 FGL-C12	Preclass-1.50 FGL-D12	Preclass-1.50 FGL-D13	Preclass-SP-Black Fines-1	Preclass-SP-Black Fines-2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-1.50	0.00-1.50	0.00-1.50	None Supplied	None Supplied
Date Sampled				26/09/2022	26/09/2022	26/09/2022	20/09/2022	20/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	12	14	13	12
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK	NTK	NTK	NTK	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.3	7.4	8.4	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	700	170	360	930	1200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.35	0.083	0.18	0.47	0.59
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	352	83.4	181	466	594
Total Potential Sulphate	mg/kg	30	NONE	2100	1000	1100	4200	4000
Sulphide	mg/kg	1	MCERTS	6.1	1	5.4	19	17
Elemental Sulphur	mg/kg	5	MCERTS	31	13	49	13	28
Total Sulphur	mg/kg	50	MCERTS	680	330	350	1400	1300
Total Sulphur	%	0.005	MCERTS	0.068	0.033	0.035	0.14	0.134
Organic Matter (automated)	%	0.1	MCERTS	3.2	1.6	1.7	3	3.1
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.018	0.0092	0.0099	0.017	0.018

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.35	< 0.05	< 0.05	< 0.05	0.25
Fluorene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	0.94	1.9
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	0.22	0.36
Fluoranthene	mg/kg	0.05	MCERTS	1.5	0.28	< 0.05	1.6	2.4
Pyrene	mg/kg	0.05	MCERTS	1.3	0.25	< 0.05	1.3	2.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.51	< 0.05	< 0.05	0.72	1
Chrysene	mg/kg	0.05	MCERTS	0.72	< 0.05	< 0.05	0.97	1.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	0.62	0.97
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.36	< 0.05	< 0.05	0.54	0.64
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05	0.66	0.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.27	0.39
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.37	0.57

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.57	< 0.80	< 0.80	8.19	12.7

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	9.4	8.5	42	48
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.78	0.84	1	2.7	2.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.8	0.5	1.2	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	16	18	34	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	26	23	88	88

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445513	2445514	2445515	2445516	2445517
Sample Reference				Preclass-1.50 FGL-C12	Preclass-1.50 FGL-D12	Preclass-1.50 FGL-D13	Preclass-SP-Black Fines-1	Preclass-SP-Black Fines-2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-1.50	0.00-1.50	0.00-1.50	None Supplied	None Supplied
Date Sampled				26/09/2022	26/09/2022	26/09/2022	20/09/2022	20/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	16	13	51	59
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	20	28	51	54
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	22	23	96	100
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	43	57	69	84
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445513	2445514	2445515	2445516	2445517
Sample Reference				Preclass-1.50 FGL-C12	Preclass-1.50 FGL-D12	Preclass-1.50 FGL-D13	Preclass-SP-Black Fines-1	Preclass-SP-Black Fines-2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-1.50	0.00-1.50	0.00-1.50	None Supplied	None Supplied
Date Sampled				26/09/2022	26/09/2022	26/09/2022	20/09/2022	20/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	170	130
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	12	8.7
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	64	45
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	26	14
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	< 10	< 10	76	53
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10	100	67
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	11	< 10
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	54	39
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	15
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	64	48
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	< 10	< 10	64	63

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445518
Sample Reference				Preclass-SP-Black Fines-3
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				20/09/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	10
Total mass of sample received	kg	0.001	NONE	0.9

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	NTK

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	910
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.46
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	457
Total Potential Sulphate	mg/kg	30	NONE	3700
Sulphide	mg/kg	1	MCERTS	25
Elemental Sulphur	mg/kg	5	MCERTS	28
Total Sulphur	mg/kg	50	MCERTS	1200
Total Sulphur	%	0.005	MCERTS	0.123
Organic Matter (automated)	%	0.1	MCERTS	2.9
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.017

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2
Anthracene	mg/kg	0.05	MCERTS	0.51
Fluoranthene	mg/kg	0.05	MCERTS	3.6
Pyrene	mg/kg	0.05	MCERTS	3.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7
Chrysene	mg/kg	0.05	MCERTS	1.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.61
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.73

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	17.5

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	39
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.3
Boron (water soluble)	mg/kg	0.2	MCERTS	3.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	90

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Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445518
Sample Reference				Preclass-SP-Black Fines-3
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				20/09/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	47
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	47
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	89
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	64

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0

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Analytical Report Number: 22-87588
Project / Site name: Stopes Road

Lab Sample Number				2445518
Sample Reference				Preclass-SP-Black Fines-3
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				20/09/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Petroleum Hydrocarbons				
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	190
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	45
TPH-CWG - Aliphatic > EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	29
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	45
TPH-CWG - Aliphatic (EC5 - EC44) EH_CU+HS_1D_AL	mg/kg	10	NONE	75
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	19
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	71
TPH-CWG - Aromatic > EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	39
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	89
TPH-CWG - Aromatic (EC5 - EC44) EH_CU+HS_1D_AR	mg/kg	10	NONE	130

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-87588
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2445513	class-1.50 FGL-	None Supplied	0.00-1.50	Brown clay and sand with gravel.
2445514	class-1.50 FGL-	None Supplied	0.00-1.50	Brown clay and sand with gravel.
2445515	class-1.50 FGL-	None Supplied	0.00-1.50	Brown clay and sand with gravel.
2445516	ass-SP-Black Fir	None Supplied	None Supplied	Brown sandy loam with gravel.
2445517	ass-SP-Black Fir	None Supplied	None Supplied	Brown sandy loam with gravel.
2445518	ass-SP-Black Fir	None Supplied	None Supplied	Brown sandy loam with gravel.

Analytical Report Number : 22-87588
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-87588
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-87588
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Analytical Report Number : 22-87588
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
Preclass-SP-Black Fines-1	None Supplied	S	2445516	c	Sulphide in soil	L010-PL	c
Preclass-SP-Black Fines-1	None Supplied	S	2445516	c	Total cyanide in soil	L080-PL	c
Preclass-SP-Black Fines-2	None Supplied	S	2445517	c	Sulphide in soil	L010-PL	c
Preclass-SP-Black Fines-2	None Supplied	S	2445517	c	Total cyanide in soil	L080-PL	c
Preclass-SP-Black Fines-3	None Supplied	S	2445518	c	Sulphide in soil	L010-PL	c
Preclass-SP-Black Fines-3	None Supplied	S	2445518	c	Total cyanide in soil	L080-PL	c

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 22-87591

Project / Site name:	Stopes Road	**Samples received on:**	30/09/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	30/09/2022
Your order number:		**Analysis completed by:**	07/10/2022
Report Issue Number:	1	**Report issued on:**	07/10/2022
Samples Analysed:	3 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-87591
Project / Site name: Stopes Road

Lab Sample Number				2445538	2445539	2445540
Sample Reference				Post-HS7-D15 Mix	Post-HS7-N-1	Post-HS7-SP-B11 Mix
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				26/09/2022	26/09/2022	26/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	12	14
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.025
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.025
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	8.4	8.0	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	550	320	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.27	0.16	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	274	161	-
Total Potential Sulphate	mg/kg	30	NONE	3300	1100	-
Sulphide	mg/kg	1	MCERTS	21	1.1	-
Elemental Sulphur	mg/kg	5	MCERTS	60	13	-
Total Sulphur	mg/kg	50	MCERTS	1100	370	-
Total Sulphur	%	0.005	MCERTS	0.109	0.037	-
Organic Matter (automated)	%	0.1	MCERTS	2.7	1.8	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.016	0.01	-
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	0.8	< 0.05	5.8
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5
Acenaphthene	mg/kg	0.05	MCERTS	0.98	< 0.05	13
Fluorene	mg/kg	0.05	MCERTS	0.84	< 0.05	13
Phenanthrene	mg/kg	0.05	MCERTS	2.9	0.99	130
Anthracene	mg/kg	0.05	MCERTS	0.93	0.23	41
Fluoranthene	mg/kg	0.05	MCERTS	3	1.6	160
Pyrene	mg/kg	0.05	MCERTS	2.6	1.4	170
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.66	110
Chrysene	mg/kg	0.05	MCERTS	1.2	0.73	94
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.2	0.75	120
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.56	0.34	23
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.92	0.57	87
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.41	0.31	39
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	12
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.49	0.4	45
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	18	7.92	1070

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Analytical Report Number: 22-87591
Project / Site name: Stopes Road

Lab Sample Number				2445538	2445539	2445540
Sample Reference				Post-HS7-D15 Mix	Post-HS7-N-1	Post-HS7-SP-B11 Mix
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				26/09/2022	26/09/2022	26/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	7	26
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.78	0.72	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.5	5.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	14	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	24	50
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	12	90
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	20	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23	19	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	40	81
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	MCERTS	52	45	-
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	41
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	140
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	750
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	320
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	930
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	1200
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	3.1
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	4.7	< 2.0	66
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	18	11	680
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	30	29	1400
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	150
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	52	40	2200
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	52	40	2300

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-87591
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2445538	ost-HS7-D15 M	None Supplied	None Supplied	Brown sandy clay with gravel.
2445539	Post-HS7-N-1	None Supplied	None Supplied	Brown sandy clay.
2445540	st-HS7-SP-B11 M	None Supplied	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 22-87591
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-87591
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-92098

Project / Site name:	Stopes Road	**Samples received on:**	21/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	21/10/2022
Your order number:		**Analysis completed by:**	31/10/2022
Report Issue Number:	1	**Report issued on:**	31/10/2022
Samples Analysed:	1 soil sample		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-92098
Project / Site name: Stopes Road

Lab Sample Number				2473012
Sample Reference				SP31-STB
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				19/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.001	NONE	0.9

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	6900
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	480
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.24
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	242
Total Potential Sulphate	mg/kg	30	NONE	9900
Sulphide	mg/kg	1	NONE	5.7
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.308
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	3100
Elemental Sulphur	mg/kg	5	MCERTS	41
Total Sulphur	mg/kg	50	MCERTS	3300
Total Sulphur	%	0.005	MCERTS	0.331
Organic Matter (automated)	%	0.1	MCERTS	7.7
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.045

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	2.7

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.67
Acenaphthylene	mg/kg	0.05	NONE	< 0.05
Acenaphthene	mg/kg	0.05	NONE	1.4
Fluorene	mg/kg	0.05	NONE	1.1
Phenanthrene	mg/kg	0.05	NONE	5.2
Anthracene	mg/kg	0.05	NONE	1.5
Fluoranthene	mg/kg	0.05	NONE	5.7
Pyrene	mg/kg	0.05	NONE	5
Benzo(a)anthracene	mg/kg	0.05	NONE	2.9
Chrysene	mg/kg	0.05	NONE	2.2
Benzo(b)fluoranthene	mg/kg	0.05	NONE	2.3
Benzo(k)fluoranthene	mg/kg	0.05	NONE	1.3
Benzo(a)pyrene	mg/kg	0.05	NONE	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.77
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.22
Benzo(ghi)perylene	mg/kg	0.05	NONE	1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	33.6

Analytical Report Number: 22-92098
Project / Site name: Stopes Road

Lab Sample Number				2473012
Sample Reference				SP31-STB
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				19/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	43
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	61
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	NONE	< 1.0
Toluene	µg/kg	1	NONE	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0
Petroleum Hydrocarbons				
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	110
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	9.3
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	42
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	57
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	110
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	110

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number : 22-92098
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2473012	SP31-STB	None Supplied	None Supplied	Brown loam and sand with gravel.

Analytical Report Number : 22-92098
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-92098
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

Analytical Report Number : 22-92098
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-92102

Project / Site name:	Stopes Road	**Samples received on:**	21/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	21/10/2022
Your order number:		**Analysis completed by:**	31/10/2022
Report Issue Number:	1	**Report issued on:**	31/10/2022
Samples Analysed:	4 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-92102
Project / Site name: Stopes Road

Lab Sample Number				2473028	2473029	2473030	2473031
Sample Reference				A18	A16	SP74	SP75
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				20/10/2022	20/10/2022	20/10/2022	20/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	37	3.3	< 0.1	8.1
Moisture Content	%	0.01	NONE	11	15	24	15
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	< 0.001
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	SCA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	7.9	6.6	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1400	2300	17000	4800
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	830	350	910	1000
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.42	0.18	0.46	0.52
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	417	177	455	522
Total Potential Sulphate	mg/kg	30	NONE	3100	4900	23000	8000
Sulphide	mg/kg	1	NONE	27	120	2.7	21
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.17	0.259	0.628	0.317
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	1700	2600	6300	3200
Elemental Sulphur	mg/kg	5	MCERTS	67	52	17	44
Total Sulphur	mg/kg	50	MCERTS	1000	1600	7600	2700
Total Sulphur	%	0.005	MCERTS	0.103	0.162	0.761	0.266
Organic Matter (automated)	%	0.1	MCERTS	2.4	8	2.6	5.4
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.014	0.046	0.015	0.031

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.12	1	0.21	0.69
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.19
Acenaphthene	mg/kg	0.05	NONE	< 0.05	0.22	< 0.05	0.34
Fluorene	mg/kg	0.05	NONE	< 0.05	0.24	< 0.05	0.48
Phenanthrene	mg/kg	0.05	NONE	0.25	3.6	0.46	4.8
Anthracene	mg/kg	0.05	NONE	0.05	0.51	0.08	1.1
Fluoranthene	mg/kg	0.05	NONE	0.33	4.1	0.39	7.7
Pyrene	mg/kg	0.05	NONE	0.32	3.6	0.39	6.8
Benzo(a)anthracene	mg/kg	0.05	NONE	0.19	2.2	0.22	3.5
Chrysene	mg/kg	0.05	NONE	0.2	2.4	0.23	4.1
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.14	2.2	0.23	3.4
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.06	1	0.05	1.8
Benzo(a)pyrene	mg/kg	0.05	NONE	0.11	1.4	0.16	2.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	1	0.08	1.5
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	0.28	< 0.05	0.35
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	1.2	0.11	1.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	1.77	24.9	2.61	41.4

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	70	43	26	43
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	2.9	0.6	1.6

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Analytical Report Number: 22-92102
Project / Site name: Stopes Road

Lab Sample Number				2473028	2473029	2473030	2473031
Sample Reference				A18	A16	SP74	SP75
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				20/10/2022	20/10/2022	20/10/2022	20/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	1.5	1	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	27	17	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	79	110	49	65
Lead (aqua regia extractable)	mg/kg	1	MCERTS	73	65	38	54
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	39	62	18	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	63	69	21	49
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	100	42	73
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	280	< 10	660
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	3.7
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	13	< 8.0	14
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	55	< 8.0	74
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	25	< 8.4	47
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	69	< 10	91
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	94	< 10	140
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	1.4	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	7
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	38	< 10	56
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	100	< 10	350
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	65	< 8.4	190
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	150	< 10	410
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	210	< 10	600

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: **22-92102**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2473031	SP75		114	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 22-92102
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2473028	A18	None Supplied	None Supplied	Brown loam and sand with gravel and stones.
2473029	A16	None Supplied	None Supplied	Brown loam and sand with gravel and stones.
2473030	SP74	None Supplied	None Supplied	Brown clay with gravel.
2473031	SP75	None Supplied	None Supplied	Brown loam and clay with gravel and stones.

Analytical Report Number : 22-92102
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-92102
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

Analytical Report Number : 22-92102
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-92305

Project / Site name:	Stopes Road	**Samples received on:**	24/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	24/10/2022
Your order number:		**Analysis completed by:**	31/10/2022
Report Issue Number:	1	**Report issued on:**	31/10/2022
Samples Analysed:	4 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-92305
Project / Site name: Stopes Road

Lab Sample Number				2474271	2474272	2474273	2474274
Sample Reference				Stockpile-73	Stockpile-29	Stockpile-25	Stockpile-61
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/10/2022	24/10/2022	24/10/2022	24/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	14	15	12
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.8	8.2	7.3	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1900	1100	920	970
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	830	100	470	200
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.41	0.05	0.24	0.1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	413	50.4	237	102
Total Potential Sulphate	mg/kg	30	NONE	5000	3100	4100	2600
Sulphide	mg/kg	1	NONE	20	9.8	10	6.6
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.308	0.2	0.313	0.163
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	3100	2000	3100	1600
Elemental Sulphur	mg/kg	5	MCERTS	200	85	74	18
Total Sulphur	mg/kg	50	MCERTS	1700	1000	1400	870
Total Sulphur	%	0.005	MCERTS	0.167	0.104	0.135	0.087
Organic Matter (automated)	%	0.1	MCERTS	4.1	4	6.7	3.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.024	0.023	0.039	0.019

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.12	0.38	0.15	0.63
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	0.2	0.05	0.16
Acenaphthene	mg/kg	0.05	NONE	0.1	0.24	0.18	0.71
Fluorene	mg/kg	0.05	NONE	0.1	0.37	0.23	0.78
Phenanthrene	mg/kg	0.05	NONE	0.58	3.1	5.6	6.8
Anthracene	mg/kg	0.05	NONE	0.17	0.82	1.5	1.4
Fluoranthene	mg/kg	0.05	NONE	0.74	5.1	11	10
Pyrene	mg/kg	0.05	NONE	0.68	4.6	9.8	8.8
Benzo(a)anthracene	mg/kg	0.05	NONE	0.29	2.4	5.8	4.5
Chrysene	mg/kg	0.05	NONE	0.33	2.6	4.3	4.6
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.31	2.6	4.6	3.9
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.13	0.97	2.2	2.4
Benzo(a)pyrene	mg/kg	0.05	NONE	0.2	2.1	4.3	3.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.1	1.1	1.8	1.8
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	0.2	0.43	0.48
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.15	1.2	2.1	2.2

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-92305
Project / Site name: Stopes Road

Lab Sample Number				2474271	2474272	2474273	2474274
Sample Reference				Stockpile-73	Stockpile-29	Stockpile-25	Stockpile-61
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/10/2022	24/10/2022	24/10/2022	24/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	4	27.9	54.2	52.9
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	52	48	33
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	2.1	1.7	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.7	1.1	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	31	32	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	34	73	61	53
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	47	65	40
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	43	34	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	66	47	47
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	81	74	92	73
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	45	110	65
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	< 10

Analytical Report Number: 22-92305
Project / Site name: Stopes Road

Lab Sample Number				2474271	2474272	2474273	2474274
Sample Reference				Stockpile-73	Stockpile-29	Stockpile-25	Stockpile-61
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				24/10/2022	24/10/2022	24/10/2022	24/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	16	31	23
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	24	73	35
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	42	100	59
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	42	100	59

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-92305
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2474271	Stockpile-73	None Supplied	None Supplied	Brown loam and clay with gravel.
2474272	Stockpile-29	None Supplied	None Supplied	Brown loam and sand with gravel.
2474273	Stockpile-25	None Supplied	None Supplied	Brown loam and sand with gravel and rubble.
2474274	Stockpile-61	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 22-92305
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-92305
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-92305
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-92423

Project / Site name:	Stopes Road	**Samples received on:**	17/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	26/10/2022
Your order number:		**Analysis completed by:**	01/11/2022
Report Issue Number:	1	**Report issued on:**	02/11/2022
Samples Analysed:	7 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-92423
Project / Site name: Stopes Road

Lab Sample Number				2475030	2475031	2475032	2475033	2475034
Sample Reference				Post-HS7-1	Post-HS7-2	HS8-Base	Hs8-North	HS8-East
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				14/10/2022	14/10/2022	14/10/2022	14/10/2022	14/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	18	17	15	13
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3	0.3

Monoaromatics & Oxygenates

Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	8.4	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	33	29	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	160	230	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	31	28	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	210	260	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	240	290	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	8.3	5.8	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	39	86	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	490	800	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	870	1400	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	36	190	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	1400	2300	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	1400	2500	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-92423
Project / Site name: Stopes Road

Lab Sample Number				2475035	2475036
Sample Reference				HS8-South	HS8-West
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				14/10/2022	14/10/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	16
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Monoaromatics & Oxygenates

Benzene	µg/kg	1	NONE	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-92423
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2475030	Post-HS7-1	None Supplied	None Supplied	Brown clay and loam with gravel.
2475031	Post-HS7-2	None Supplied	None Supplied	Brown clay and loam with gravel.
2475032	HS8-Base	None Supplied	None Supplied	Brown clay and sand with gravel.
2475033	Hs8-North	None Supplied	None Supplied	Brown clay and sand with gravel.
2475034	HS8-East	None Supplied	None Supplied	Brown clay and sand with gravel.
2475035	HS8-South	None Supplied	None Supplied	Brown clay and sand with gravel.
2475036	HS8-West	None Supplied	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 22-92423
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-92426

Project / Site name:	Stopes Road	**Samples received on:**	17/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	26/10/2022
Your order number:		**Analysis completed by:**	02/11/2022
Report Issue Number:	1	**Report issued on:**	02/11/2022
Samples Analysed:	6 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-92426
Project / Site name: Stopes Road

Lab Sample Number				2475042	2475043	2475044	2475045	2475046
Sample Reference				Preclass-tp-F13-1m	Preclass-tp-E13-1m	Preclass-1m-G13	Preclass-1m-G14	Preclass-1m-F14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/10/2022	06/10/2022	11/10/2022	11/10/2022	11/11/0202
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7	3.3	29	15	9.6
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	SSZ	SSZ	SSZ	SSZ	SSZ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7	8.4	7.4	7.8	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	450	130	1500	310	410
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.23	0.065	0.76	0.16	0.2
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	227	64.9	756	156	204
Total Potential Sulphate	mg/kg	30	NONE	1700	1500	5200	1900	2300
Sulphide	mg/kg	1	NONE	43	150	46	20	25
Elemental Sulphur	mg/kg	5	MCERTS	18	19	230	25	53
Total Sulphur	mg/kg	50	MCERTS	580	490	1700	630	760
Total Sulphur	%	0.005	MCERTS	0.058	0.049	0.172	0.063	0.076
Organic Matter (automated)	%	0.1	MCERTS	1.2	0.5	11	4.6	5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0072	0.0031	0.064	0.027	0.029
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.11	0.47	0.24
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.07	< 0.05	0.08
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.2	0.53	0.14
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.21	0.43	0.14
Phenanthrene	mg/kg	0.05	NONE	0.26	< 0.05	1.8	3.5	1.2
Anthracene	mg/kg	0.05	NONE	0.08	< 0.05	0.47	0.89	0.25
Fluoranthene	mg/kg	0.05	NONE	0.45	< 0.05	3.2	4.7	1.6
Pyrene	mg/kg	0.05	NONE	0.41	< 0.05	2.9	4.3	1.5
Benzo(a)anthracene	mg/kg	0.05	NONE	0.21	< 0.05	1.8	2.3	0.68
Chrysene	mg/kg	0.05	NONE	0.17	< 0.05	1.4	1.9	0.85
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.21	< 0.05	1.6	1.8	0.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.1	< 0.05	0.71	0.98	0.32
Benzo(a)pyrene	mg/kg	0.05	NONE	0.17	< 0.05	1.3	1.8	0.68
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.07	< 0.05	0.64	1	0.42
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.21	0.21	0.11
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.11	< 0.05	0.77	1.1	0.43
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	2.24	< 0.80	17.4	25.9	9.34

Analytical Report Number: 22-92426
Project / Site name: Stopes Road

Lab Sample Number				2475042	2475043	2475044	2475045	2475046
Sample Reference				Preclass-tp-F13-1m	Preclass-tp-E13-1m	Preclass-1m-G13	Preclass-1m-G14	Preclass-1m-F14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/10/2022	06/10/2022	11/10/2022	11/10/2022	11/11/0202
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	36	31	22	26	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	7.3	1.2	1.7	1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.4	1.7	0.8	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	81	19	22	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	47	140	47	65	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	29	100	44	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	91	18	32	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	210	33	47	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82	38	81	61	97
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10	79	36	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	22	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	23	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	23	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	13	12	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	37	20	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	10	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	50	31	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	50	42	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-92426
Project / Site name: Stopes Road

Lab Sample Number				2475047
Sample Reference				Preclass-SP66-Black Sand
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				12/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	17
Total mass of sample received	kg	0.001	NONE	0.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.01
Asbestos Quantification Total	%	0.001	ISO 17025	0.01
Asbestos Analyst ID	N/A	N/A	N/A	SSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1700
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.87
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	870
Total Potential Sulphate	mg/kg	30	NONE	9800
Sulphide	mg/kg	1	NONE	42
Elemental Sulphur	mg/kg	5	MCERTS	30
Total Sulphur	mg/kg	50	MCERTS	3300
Total Sulphur	%	0.005	MCERTS	0.328
Organic Matter (automated)	%	0.1	MCERTS	6.7
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.039

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	2.7

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	2.5
Acenaphthylene	mg/kg	0.05	NONE	2
Acenaphthene	mg/kg	0.05	NONE	1.2
Fluorene	mg/kg	0.05	NONE	2.8
Phenanthrene	mg/kg	0.05	NONE	19
Anthracene	mg/kg	0.05	NONE	5.4
Fluoranthene	mg/kg	0.05	NONE	31
Pyrene	mg/kg	0.05	NONE	26
Benzo(a)anthracene	mg/kg	0.05	NONE	16
Chrysene	mg/kg	0.05	NONE	12
Benzo(b)fluoranthene	mg/kg	0.05	NONE	13
Benzo(k)fluoranthene	mg/kg	0.05	NONE	6.6
Benzo(a)pyrene	mg/kg	0.05	NONE	12
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	5.7
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	1.4
Benzo(ghi)perylene	mg/kg	0.05	NONE	6.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	163

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Analytical Report Number: 22-92426
Project / Site name: Stopes Road

Lab Sample Number				2475047
Sample Reference				Preclass-SP66-Black Sand
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				12/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	52
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120
Lead (aqua regia extractable)	mg/kg	1	MCERTS	82
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	55
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	74
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	NONE	< 1.0
Toluene	µg/kg	1	NONE	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0
Petroleum Hydrocarbons				
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	190
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	4.3
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	15
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	62
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	96
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	18
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	180
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	190

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Analytical Report Number : 22-92426
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2475042	reclass-tp-F13-1	None Supplied	None Supplied	Brown loam and sand with rubble and gravel
2475043	reclass-tp-E13-1	None Supplied	None Supplied	Black gravel with loam
2475044	Preclass-1m-G13	None Supplied	None Supplied	Brown clay and loam with gravel.
2475045	Preclass-1m-G14	None Supplied	None Supplied	Brown loam and sand with gravel.
2475046	Preclass-1m-F14	None Supplied	None Supplied	Brown loam and sand with gravel and glass.
2475047	ass-SP66-Black	None Supplied	None Supplied	Brown loam and sand with gravel.

Analytical Report Number : 22-92426
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-92426
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-92426
Project / Site name: Stopes Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
Preclass-1m-F14	None Supplied	S	2475046	c	Hexavalent chromium in soil	L080-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Elemental sulphur in soil	L021-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Fraction Organic Carbon FOC Automated	L009	c
Preclass-1m-F14	None Supplied	S	2475046	c	Monohydric phenols in soil	L080-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Organic matter (Automated) in soil	L009-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Speciated EPA-16 PAHs in soil	L064-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Sulphide in soil	L010-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	TPH Banding in Soil by FID	L076-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	TPH in (Soil)	L076-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	TPHCWG (Soil)	L088/76-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	Total cyanide in soil	L080-PL	c
Preclass-1m-F14	None Supplied	S	2475046	c	pH in soil (automated)	L099-PL	c
Preclass-1m-G13	None Supplied	S	2475044	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
Preclass-1m-G13	None Supplied	S	2475044	c	Sulphide in soil	L010-PL	c
Preclass-1m-G13	None Supplied	S	2475044	c	TPH in (Soil)	L076-PL	c
Preclass-1m-G13	None Supplied	S	2475044	c	Total cyanide in soil	L080-PL	c
Preclass-1m-G14	None Supplied	S	2475045	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
Preclass-1m-G14	None Supplied	S	2475045	c	Sulphide in soil	L010-PL	c
Preclass-1m-G14	None Supplied	S	2475045	c	TPH in (Soil)	L076-PL	c
Preclass-1m-G14	None Supplied	S	2475045	c	Total cyanide in soil	L080-PL	c
Preclass-SP66-Black Sand	None Supplied	S	2475047	c	Sulphide in soil	L010-PL	c
Preclass-SP66-Black Sand	None Supplied	S	2475047	c	Total cyanide in soil	L080-PL	c
Preclass-tp-E13-1m	None Supplied	S	2475043	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
Preclass-tp-E13-1m	None Supplied	S	2475043	c	Sulphide in soil	L010-PL	c
Preclass-tp-E13-1m	None Supplied	S	2475043	c	TPH in (Soil)	L076-PL	c
Preclass-tp-E13-1m	None Supplied	S	2475043	c	Total cyanide in soil	L080-PL	c
Preclass-tp-F13-1m	None Supplied	S	2475042	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
Preclass-tp-F13-1m	None Supplied	S	2475042	c	Sulphide in soil	L010-PL	c
Preclass-tp-F13-1m	None Supplied	S	2475042	c	TPH in (Soil)	L076-PL	c
Preclass-tp-F13-1m	None Supplied	S	2475042	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-93221

Project / Site name:	Stopes Road	**Samples received on:**	27/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	27/10/2022
Your order number:		**Analysis completed by:**	07/11/2022
Report Issue Number:	1	**Report issued on:**	07/11/2022
Samples Analysed:	6 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-93221
Project / Site name: Stopes Road

Lab Sample Number				2479396	2479397	2479398	2479399	2479400
Sample Reference				TP-G4-1	TP-G4-2	TP-G4-3	Preclass - I14	Preclass - I15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	1.00	1.00	None Supplied	None Supplied
Date Sampled				26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	4.7	11	10	9.8	11
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3	0.3	0.3
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SZS	SZS	SZS	SZS	SZS
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	8.1	7.4	10.7	10.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.006	0.011	0.021	0.31	0.3
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	12	22	41	620	610
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	6	11	20.5	310	304
Total Potential Sulphate	mg/kg	30	NONE	220	380	330	4000	3400
Sulphide	mg/kg	1	NONE	1.2	1.2	< 1.0	160	59
Elemental Sulphur	mg/kg	5	MCERTS	6.5	< 5.0	< 5.0	8.7	12
Total Sulphur	mg/kg	50	MCERTS	74	130	110	1300	1100
Total Sulphur	%	0.005	MCERTS	0.007	0.013	0.011	0.133	0.114
Organic Matter (automated)	%	0.1	MCERTS	1.3	1.3	1.7	1.3	1.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0077	0.0078	0.0096	0.0075	0.0075
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.11	0.22
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.16	0.19
Phenanthrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	1.3	1.7
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.37	0.46
Fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	2.2	2.6
Pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	2	2.3
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	1	1.2
Chrysene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.86	1.2
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.77	0.96
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.52	0.67
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.83	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.48	0.57
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.1	0.13
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.5	0.69
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	< 0.80	< 0.80	11.2	13.9

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Analytical Report Number: 22-93221
Project / Site name: Stopes Road

Lab Sample Number				2479396	2479397	2479398	2479399	2479400
Sample Reference				TP-G4-1	TP-G4-2	TP-G4-3	Preclass - I14	Preclass - I15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	1.00	1.00	None Supplied	None Supplied
Date Sampled				26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.4	6.3	7.1	20	17
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.84	0.84	0.81	1	1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	0.2	< 0.2	1.8	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	17	16	20	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	21	30	33	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	13	15	49	51
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	31	33	23	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	18	20	31	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	64	64	61	94	91
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10	< 10	370	210
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	5.7	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	11	3.9
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	23	15
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	130	85
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	77	38
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	170	100
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10	250	140
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	4.7	4.9
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	20	17
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	84	45
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	58	11
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	110	66
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	170	77

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-93221
Project / Site name: Stopes Road

Lab Sample Number				2479401
Sample Reference				Preclass - H15
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				26/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	12
Total mass of sample received	kg	0.001	NONE	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SZS

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.33
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	670
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	333
Total Potential Sulphate	mg/kg	30	NONE	3700
Sulphide	mg/kg	1	NONE	41
Elemental Sulphur	mg/kg	5	MCERTS	23
Total Sulphur	mg/kg	50	MCERTS	1200
Total Sulphur	%	0.005	MCERTS	0.123
Organic Matter (automated)	%	0.1	MCERTS	2
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.012

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.26
Acenaphthylene	mg/kg	0.05	NONE	0.08
Acenaphthene	mg/kg	0.05	NONE	0.31
Fluorene	mg/kg	0.05	NONE	0.34
Phenanthrene	mg/kg	0.05	NONE	2.6
Anthracene	mg/kg	0.05	NONE	0.64
Fluoranthene	mg/kg	0.05	NONE	3.9
Pyrene	mg/kg	0.05	NONE	3.6
Benzo(a)anthracene	mg/kg	0.05	NONE	1.9
Chrysene	mg/kg	0.05	NONE	1.8
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.4
Benzo(k)fluoranthene	mg/kg	0.05	NONE	1.2
Benzo(a)pyrene	mg/kg	0.05	NONE	1.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.87
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.22
Benzo(ghi)perylene	mg/kg	0.05	NONE	1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	21.5

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Analytical Report Number: 22-93221
Project / Site name: Stopes Road

Lab Sample Number				2479401
Sample Reference				Preclass - H15
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				26/10/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.92
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	90
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100
Monoaromatics & Oxygenates				
Benzene	µg/kg	1	NONE	< 1.0
Toluene	µg/kg	1	NONE	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0
Petroleum Hydrocarbons				
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	210
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	3.8
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	18
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	88
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	43
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	110
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	150
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	2.9
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	16
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	41
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	18
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	60
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	78

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Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2479396	TP-G4-1	None Supplied	1	Brown clay and loam with gravel and vegetation.
2479397	TP-G4-2	None Supplied	1	Brown clay and loam with gravel and vegetation.
2479398	TP-G4-3	None Supplied	1	Brown clay and loam with gravel and vegetation.
2479399	Preclass - I14	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2479400	Preclass - I15	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
2479401	Preclass - H15	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 22-93221
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-93221
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-93452

Project / Site name:	Stopes Road	**Samples received on:**	31/10/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	31/10/2022
Your order number:		**Analysis completed by:**	08/11/2022
Report Issue Number:	1	**Report issued on:**	08/11/2022
Samples Analysed:	3 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-93452
Project / Site name: Stopes Road

Lab Sample Number				2480888	2480889	2480890
Sample Reference				POS-GC 1	POS-GC 2	POS-GC 3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				1.60	1.70	1.65
Date Sampled				27/10/2022	27/10/2022	27/10/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	13	13
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	7.6	7.8	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	68	72	240
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	16	18	19
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0079	0.009	0.0094
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	7.9	9	9.4
Total Potential Sulphate	mg/kg	30	NONE	560	680	440
Sulphide	mg/kg	1	NONE	1.1	1.8	< 1.0
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.049	0.06	0.021
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	490	600	210
Elemental Sulphur	mg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	190	230	150
Total Sulphur	%	0.005	MCERTS	0.019	0.023	0.015
Organic Matter (automated)	%	0.1	MCERTS	1.7	1.8	1.9
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.01	0.011	0.011
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	NONE	0.12	0.12	0.11
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	NONE	0.05	0.06	0.12
Pyrene	mg/kg	0.05	NONE	0.07	0.1	0.14
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.07
Chrysene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.08
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.06
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.06
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 22-93452
Project / Site name: Stopes Road

Lab Sample Number				2480888	2480889	2480890
Sample Reference				POS-GC 1	POS-GC 2	POS-GC 3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				1.60	1.70	1.65
Date Sampled				27/10/2022	27/10/2022	27/10/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.5	6.8	6.9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.85	0.86	0.84
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	20	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	24	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	16	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	29	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	21	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63	63	64
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons						
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-93452
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2480888	POS-GC 1	None Supplied	1.6	Brown clay with gravel.
2480889	POS-GC 2	None Supplied	1.7	Brown clay and loam with gravel.
2480890	POS-GC 3	None Supplied	1.65	Brown clay and loam with gravel.

Analytical Report Number : 22-93452
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE

Analytical Report Number : 22-93452
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

Analytical Report Number : 22-93452
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-94864

Project / Site name:	Stopes road	**Samples received on:**	03/11/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	07/11/2022
Your order number:		**Analysis completed by:**	16/11/2022
Report Issue Number:	1	**Report issued on:**	16/11/2022
Samples Analysed:	1 soil sample		

Signed:

Elżbieta Suchy
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 22-94864
Project / Site name: Stopes road

Lab Sample Number				2489043
Sample Reference				POS-N VHE808
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				03/11/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	17
Total mass of sample received	kg	0.001	NONE	0.5

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	5.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	150
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17
Total Potential Sulphate	mg/kg	30	NONE	290
Sulphide	mg/kg	1	NONE	< 1.0
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.014
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	140
Elemental Sulphur	mg/kg	5	NONE	< 5.0
Total Sulphur	mg/kg	50	MCERTS	96
Total Sulphur	%	0.005	MCERTS	0.01
Organic Matter (automated)	%	0.1	MCERTS	1.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0074

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05
Phenanthrene	mg/kg	0.05	NONE	< 0.05
Anthracene	mg/kg	0.05	NONE	< 0.05
Fluoranthene	mg/kg	0.05	NONE	< 0.05
Pyrene	mg/kg	0.05	NONE	< 0.05
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05
Chrysene	mg/kg	0.05	NONE	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80

Analytical Report Number: 22-94864
Project / Site name: Stopes road

Lab Sample Number				2489043
Sample Reference				POS-N VHE808
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				03/11/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.76
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47
Petroleum Hydrocarbons				
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-94864
Project / Site name: Stopes road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2489043	POS-N VHE808	None Supplied	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 22-94864
Project / Site name: Stopes road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-94864
Project / Site name: Stopes road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 22-94864
Project / Site name: Stopes road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
POS-N VHE808	None Supplied	S	2489043	b	Monohydric phenols in soil	L080-PL	b
POS-N VHE808	None Supplied	S	2489043	b	Speciated EPA-16 PAHs in soil	L064-PL	b

Key: **a** - No sampling date **b** - Incorrect container
c - Holding time **d** - Headspace **e** - Temperature

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Analytical Report Number : 22-95424

Project / Site name:	Stopes Road	**Samples received on:**	08/11/2022
Your job number:	808	**Samples instructed on/ Analysis started on:**	08/11/2022
Your order number:		**Analysis completed by:**	21/11/2022
Report Issue Number:	1	**Report issued on:**	21/11/2022
Samples Analysed:	3 soil samples		

Signed: Izabela Wójcik

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing

Analytical Report Number: 22-95424
Project / Site name: Stopes Road

Lab Sample Number				2492427	2492428	2492429
Sample Reference				E3-0.5M-YB Clay	E3-2M-GG Clay	G4-0.5M-Yellow Clay
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.00	0.50
Date Sampled				02/11/2022	02/11/2022	02/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	11	21
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	ASE	ASE	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6	7	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	130	61	300
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	8.9	21	87
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0045	0.011	0.043
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	4.5	10.6	43.4
Total Potential Sulphate	mg/kg	30	NONE	430	270	670
Sulphide	mg/kg	1	NONE	< 1.0	2.2	4.6
Oxidisable Sulphide (as SO4)	%	0.002	NONE	0.03	0.021	0.037
Oxidisable Sulphide (as SO4)	mg/kg	20	NONE	300	210	370
Elemental Sulphur	mg/kg	5	NONE	< 5.0	< 5.0	14
Total Sulphur	mg/kg	50	MCERTS	140	92	220
Total Sulphur	%	0.005	MCERTS	0.014	0.009	0.022
Organic Matter (automated)	%	0.1	MCERTS	1.6	1.7	2.5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0094	0.01	0.014

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.32	0.35	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	NONE	< 0.05	0.1	0.11
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.16
Pyrene	mg/kg	0.05	NONE	0.05	< 0.05	0.15
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.08
Chrysene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.07
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.09
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	< 0.80	< 0.80

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-95424
Project / Site name: Stopes Road

Lab Sample Number				2492427	2492428	2492429
Sample Reference				E3-0.5M-YB Clay	E3-2M-GG Clay	G4-0.5M-Yellow Clay
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.00	0.50
Date Sampled				02/11/2022	02/11/2022	02/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.3	6.3	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	0.82	0.52
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	17	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	22	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	12	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	33	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	20	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	62	43
Petroleum Hydrocarbons						
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	NONE	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-95424
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2492427	E3-0.5M-YB Clay	None Supplied	0.5	Brown clay with vegetation.
2492428	E3-2M-GG Clay	None Supplied	2	Brown clay and sand.
2492429	4-0.5M-Yellow C	None Supplied	0.5	Brown clay.

Analytical Report Number : 22-95424
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Oxidisable Sulphide in soil	Determination of oxidisable sulphide in soil by calculation from total sulphur and total sulphate.	In-house method based on TRL 447		D	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 22-95424
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-31376-2

Replaces Analytical Report Number: 23-31376, issue no. 1
Additional analysis undertaken.
TPH CWG added to all samples

Project / Site name:	Stopes Road	**Samples received on:**	28/04/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	28/04/2023
Your order number:		**Analysis completed by:**	22/05/2023
Report Issue Number:	2	**Report issued on:**	23/05/2023
Samples Analysed:	11 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665498	2665499	2665500	2665501	2665502
Sample Reference				Type 2 - Area 4 - 1	Type 2 - Area 4 - 2	Type 2 - Area 4 - 3	Type 2 - Area 4 - 4	Type 2 - Area 4 - 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/04/2023	27/04/2023	27/04/2023	27/04/2023	27/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	24	12	45	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	13	15	18	16
Total mass of sample received	kg	0.001	NONE	1	1	1	1	1
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite	Amosite	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.39	0.008	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.39	0.008	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO	PDO	PDO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8	8	7.3	7.4	7.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1000	-	-	1600	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.5	-	-	0.82	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	505	-	-	818	-
Total Potential Sulphate	mg/kg	30	NONE	5500	-	-	11000	-
Sulphide	mg/kg	1	NONE	5.3	21	18	15	8.4
Elemental Sulphur	mg/kg	5	NONE	14	21	46	140	46
Total Sulphur	mg/kg	50	MCERTS	1800	-	-	3700	-
Total Sulphur	%	0.005	MCERTS	0.185	-	-	0.369	-
Organic Matter (automated)	%	0.1	MCERTS	5	-	-	4.7	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.029	0.023	0.025	0.027	0.026
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	0.39	0.33	0.31	0.44	0.36
Acenaphthylene	mg/kg	0.05	NONE	0.25	0.21	< 0.05	0.08	< 0.05
Acenaphthene	mg/kg	0.05	NONE	0.29	0.36	0.12	0.12	0.12
Fluorene	mg/kg	0.05	NONE	0.41	0.54	0.11	0.13	0.15
Phenanthrene	mg/kg	0.05	NONE	3.6	3.9	1.4	1.3	3.1
Anthracene	mg/kg	0.05	NONE	0.89	0.93	0.27	0.29	0.63
Fluoranthene	mg/kg	0.05	NONE	6.1	6.1	1.9	1.8	4.8
Pyrene	mg/kg	0.05	NONE	5.3	5.3	1.7	1.6	4.1
Benzo(a)anthracene	mg/kg	0.05	NONE	2.8	2.9	0.95	0.92	2.1
Chrysene	mg/kg	0.05	NONE	2.7	2.7	0.94	0.94	2
Benzo(b)fluoranthene	mg/kg	0.05	NONE	2.8	2.4	0.82	0.9	1.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.87	1.3	0.39	0.3	0.78
Benzo(a)pyrene	mg/kg	0.05	NONE	2.1	1.9	0.59	0.57	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	1.1	1	0.37	0.35	0.68
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.33	0.33	< 0.05	< 0.05	0.22
Benzo(ghi)perylene	mg/kg	0.05	NONE	1.3	1.1	0.48	0.47	0.79
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	31.4	31.2	10.4	10.1	22.8
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	45	37	44	43

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Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665498	2665499	2665500	2665501	2665502
Sample Reference				Type 2 - Area 4 - 1	Type 2 - Area 4 - 2	Type 2 - Area 4 - 3	Type 2 - Area 4 - 4	Type 2 - Area 4 - 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/04/2023	27/04/2023	27/04/2023	27/04/2023	27/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.9	2	1.1	1.4	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	3.4	2.5	0.9	1.6	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	24	20	70	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	85	82	58	95	79
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140	60	33	49	42
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	43	33	37	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	56	42	50	47
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	120	46	67	57
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	180	77	11	21	65
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	1.8	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	11	3.5	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	23	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	74	34	< 8.0	11	20
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	52	26	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	110	45	< 10	15	27
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	160	71	< 10	16	33
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	18	< 10	< 10	< 10	15
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	24	11	< 10	< 10	17
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	44	20	< 10	< 10	33
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	45	20	< 10	< 10	34

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665503	2665504	2665505	2665506	2665507
Sample Reference				Type 2 - Area 4 - 6	Type 2 - Area 4 - 7	Type 2 - Area 4 - 8	Type 2 - Area 4 - 9	Type 2 - Area 4 - 10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/04/2023	27/04/2023	27/04/2023	27/04/2023	27/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	26	38
Moisture Content	%	0.01	NONE	21	20	21	17	17
Total mass of sample received	kg	0.001	NONE	1	1	1	1	1
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO	PDO	PDO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8	8.2	7.6	8	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Total Potential Sulphate	mg/kg	30	NONE	-	-	-	-	-
Sulphide	mg/kg	1	NONE	30	42	39	32	25
Elemental Sulphur	mg/kg	5	NONE	50	37	250	48	33
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.019	0.028	0.024	0.02	0.018
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	0.14	0.16	0.14	0.23	0.24
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.14	0.07
Acenaphthene	mg/kg	0.05	NONE	0.07	0.11	< 0.05	0.24	0.19
Fluorene	mg/kg	0.05	NONE	0.08	0.08	0.08	0.3	0.18
Phenanthrene	mg/kg	0.05	NONE	0.72	1.1	0.62	2.6	1.7
Anthracene	mg/kg	0.05	NONE	0.14	0.24	0.13	0.62	0.35
Fluoranthene	mg/kg	0.05	NONE	1	1.6	1	3.9	2.2
Pyrene	mg/kg	0.05	NONE	0.91	1.4	0.89	3.5	2
Benzo(a)anthracene	mg/kg	0.05	NONE	0.6	0.89	0.51	1.9	1.1
Chrysene	mg/kg	0.05	NONE	0.6	0.93	0.54	1.9	1.1
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.49	0.78	0.49	1.8	0.91
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.27	0.38	0.22	0.8	0.42
Benzo(a)pyrene	mg/kg	0.05	NONE	0.36	0.58	0.34	1.3	0.62
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.25	0.46	0.21	0.7	0.34
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.21	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.31	0.57	0.29	0.96	0.46
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	5.98	9.24	5.5	21	11.9
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	53	49	52	43	40

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Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665503	2665504	2665505	2665506	2665507
Sample Reference				Type 2 - Area 4 - 6	Type 2 - Area 4 - 7	Type 2 - Area 4 - 8	Type 2 - Area 4 - 9	Type 2 - Area 4 - 10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/04/2023	27/04/2023	27/04/2023	27/04/2023	27/04/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.5	1.5	1.4	1.7	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	2	0.7	0.9	1.2	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	21	21	20	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70	69	67	72	67
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	33	37	33	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	32	31	35	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	48	47	48	43
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	49	55	51	55
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	60	65	< 10	130	55
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	4.6	4.4
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	13	9.5
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	19	21	< 8.0	51	29
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	17	11
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	21	24	< 10	69	43
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	29	31	< 10	86	54
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	2.6	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	< 10	12	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	20	22	< 10	29	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	13	11	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	26	29	< 10	43	< 10
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	39	40	< 10	50	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665508
Sample Reference				Type 2 - Area 4 - 11
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				27/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	22
Total mass of sample received	kg	0.001	NONE	1

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-
Asbestos Quantification Total	%	0.001	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-
Total Potential Sulphate	mg/kg	30	NONE	-
Sulphide	mg/kg	1	NONE	18
Elemental Sulphur	mg/kg	5	NONE	37
Total Sulphur	mg/kg	50	MCERTS	-
Total Sulphur	%	0.005	MCERTS	-
Organic Matter (automated)	%	0.1	MCERTS	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.024

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.26
Acenaphthylene	mg/kg	0.05	NONE	0.11
Acenaphthene	mg/kg	0.05	NONE	0.2
Fluorene	mg/kg	0.05	NONE	0.22
Phenanthrene	mg/kg	0.05	NONE	2.2
Anthracene	mg/kg	0.05	NONE	0.55
Fluoranthene	mg/kg	0.05	NONE	3.4
Pyrene	mg/kg	0.05	NONE	3
Benzo(a)anthracene	mg/kg	0.05	NONE	1.6
Chrysene	mg/kg	0.05	NONE	1.6
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.4
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.66
Benzo(a)pyrene	mg/kg	0.05	NONE	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.57
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.2
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.74

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	17.8

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	56

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Analytical Report Number: 23-31376
Project / Site name: Stopes Road

Lab Sample Number				2665508
Sample Reference				Type 2 - Area 4 - 11
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				27/04/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	69
Lead (aqua regia extractable)	mg/kg	1	MCERTS	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51
Monoaromatics & Oxygenates				
Benzene	µg/kg	5	NONE	< 5.0
Toluene	µg/kg	5	NONE	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0
Petroleum Hydrocarbons				
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	98
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	2.8
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	9.5
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	36
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	13
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	49
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	62
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	2.2
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	12
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	23
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	36
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	43

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: **23-31376**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2665498	Type 2 - Area 4 - 1		150	Loose Fibrous Debris	**Amosite**	0.390	**0.390**
2665499	Type 2 - Area 4 - 2		158	Loose Fibres	**Amosite**	0.008	**0.008**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 23-31376
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2665498	ype 2 - Area 4 -	None Supplied	None Supplied	Grey gravelly sand with stones.
2665499	ype 2 - Area 4 -	None Supplied	None Supplied	Grey gravelly sand with stones.
2665500	ype 2 - Area 4 -	None Supplied	None Supplied	Grey gravelly sand with stones.
2665501	ype 2 - Area 4 -	None Supplied	None Supplied	Grey gravelly sand.
2665502	ype 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel.
2665503	ype 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel.
2665504	ype 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel.
2665505	ype 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel and vegetation.
2665506	ype 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel and stones.
2665507	pe 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with stones.
2665508	pe 2 - Area 4 -	None Supplied	None Supplied	Grey sandy clay with gravel.

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Analytical Report Number : 23-31376
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

Analytical Report Number : 23-31376
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-32486

Project / Site name:	Stopes Road	**Samples received on:**	09/05/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	09/05/2023
Your order number:		**Analysis completed by:**	15/05/2023
Report Issue Number:	1	**Report issued on:**	15/05/2023
Samples Analysed:	12 soil samples		

Signed:

Elżbieta Suchy
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671619	2671620	2671621	2671622	2671623
Sample Reference				6F2 - SP - 1	6F2 - SP - 2	6F2 - SP - 3	6F2 - SP - 4	6F2 - SP - 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023	04/05/2023	04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	59	69	53	44	59
Moisture Content	%	0.01	NONE	3.4	1.4	2.2	6.1	5.5
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	JSW	JSW
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.1	11.8	11.4	10.4	11
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	450	140	370	620	510
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.22	0.072	0.18	0.31	0.25
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	223	71.7	183	310	253
Total Potential Sulphate	mg/kg	30	NONE	5400	4700	4600	3900	4300
Sulphide	mg/kg	1	NONE	64	49	61	33	17
Elemental Sulphur	mg/kg	5	NONE	7.9	< 5.0	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1800	1600	1500	1300	1400
Total Sulphur	%	0.005	MCERTS	0.181	0.158	0.153	0.13	0.143
Organic Matter (automated)	%	0.1	MCERTS	5.1	4	5	5.1	3.7
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.03	0.023	0.029	0.03	0.021
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	0.19	0.16	0.19	0.17	0.41
Acenaphthylene	mg/kg	0.05	NONE	0.08	0.05	0.07	0.11	0.06
Acenaphthene	mg/kg	0.05	NONE	0.23	0.07	0.12	0.13	1.4
Fluorene	mg/kg	0.05	NONE	0.29	0.11	0.18	0.22	1.4
Phenanthrene	mg/kg	0.05	NONE	3.2	0.89	2.2	2	15
Anthracene	mg/kg	0.05	NONE	0.73	0.19	0.51	0.46	3.2
Fluoranthene	mg/kg	0.05	NONE	4.4	1.3	3.5	3.2	16
Pyrene	mg/kg	0.05	NONE	3.9	1.2	3.1	2.8	14
Benzo(a)anthracene	mg/kg	0.05	NONE	1.8	0.56	1.4	1.3	6
Chrysene	mg/kg	0.05	NONE	2.1	0.68	1.7	1.6	7.1
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.9	0.63	1.5	1.4	6.8
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.76	0.31	0.75	0.63	2.7
Benzo(a)pyrene	mg/kg	0.05	NONE	1.5	0.51	1.2	1.1	5.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.63	0.23	0.51	0.47	2.2
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.2	< 0.05	< 0.05	< 0.05	0.75
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.77	0.34	0.61	0.51	2.5
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	22.6	7.29	17.4	16	84.4

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Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671619	2671620	2671621	2671622	2671623
Sample Reference				6F2 - SP - 1	6F2 - SP - 2	6F2 - SP - 3	6F2 - SP - 4	6F2 - SP - 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023	04/05/2023	04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	13	18	17	16
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.91	0.78	1	0.98	0.99
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.9	1.7	0.7	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	16	17	18	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	30	40	40	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	21	27	31	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	18	22	23	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	30	36	34	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	50	59	64	74
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	NONE	1100	1400	1500	1700	1600

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671624	2671625	2671626	2671627	2671628
Sample Reference				6F2 - SP - 6	6F2 - SP - 7	6F2 - SP - 8	6F2 - SP - 9	6F2 - SP - 10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023	04/05/2023	04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	72	33	56	65	57
Moisture Content	%	0.01	NONE	2.7	4.6	3.8	3.1	5.3
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	JSW	EC	EC	EC	EC
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.9	10.6	11.3	11.7	10.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	830	650	380	300	470
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.42	0.33	0.19	0.15	0.24
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	416	327	192	150	235
Total Potential Sulphate	mg/kg	30	NONE	3400	4600	4600	5100	3000
Sulphide	mg/kg	1	NONE	3.9	21	35	17	42
Elemental Sulphur	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	1100	1500	1500	1700	1000
Total Sulphur	%	0.005	MCERTS	0.114	0.153	0.152	0.171	0.101
Organic Matter (automated)	%	0.1	MCERTS	1.3	5.1	3.5	2.7	3.3
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0074	0.03	0.021	0.016	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.16	0.13	0.15
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.08	0.05	0.06
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.15	0.08	0.13
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.18	0.13	0.16
Phenanthrene	mg/kg	0.05	NONE	0.44	0.11	1.8	1.3	1.6
Anthracene	mg/kg	0.05	NONE	0.13	< 0.05	0.41	0.27	0.35
Fluoranthene	mg/kg	0.05	NONE	0.83	0.12	2.8	2	2.4
Pyrene	mg/kg	0.05	NONE	0.75	0.11	2.4	1.8	2.1
Benzo(a)anthracene	mg/kg	0.05	NONE	0.42	< 0.05	1.1	0.83	0.93
Chrysene	mg/kg	0.05	NONE	0.4	0.06	1.4	0.99	1.2
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.42	0.08	1.2	0.97	1.1
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.18	< 0.05	0.53	0.42	0.37
Benzo(a)pyrene	mg/kg	0.05	NONE	0.35	0.06	1.1	0.69	0.75
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.2	< 0.05	0.37	0.3	0.35
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.09	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.21	< 0.05	0.48	0.34	0.43
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	4.33	< 0.80	14.1	10.4	12

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Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671624	2671625	2671626	2671627	2671628
Sample Reference				6F2 - SP - 6	6F2 - SP - 7	6F2 - SP - 8	6F2 - SP - 9	6F2 - SP - 10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023	04/05/2023	04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.7	19	18	14	17
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.57	1.1	1.1	0.98	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	1.8	0.5	1	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	20	19	20	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	43	43	39	38
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	35	32	22	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	26	24	24	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	39	37	34	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	89	110	93	56
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	410	2100	1700	1000	1400

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671629	2671630
Sample Reference				6F2 - SP - 11	6F2 - SP - 12
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	73	47
Moisture Content	%	0.01	NONE	1.6	2.4
Total mass of sample received	kg	0.001	NONE	0.8	0.8
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	EC	EC

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.9	10.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	350	620
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.17	0.31
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	174	308
Total Potential Sulphate	mg/kg	30	NONE	2800	4400
Sulphide	mg/kg	1	NONE	28	28
Elemental Sulphur	mg/kg	5	NONE	< 5.0	< 5.0
Total Sulphur	mg/kg	50	MCERTS	950	1500
Total Sulphur	%	0.005	MCERTS	0.095	0.147
Organic Matter (automated)	%	0.1	MCERTS	2.8	5
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.016	0.029

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.09	0.16
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	0.07
Acenaphthene	mg/kg	0.05	NONE	0.1	0.24
Fluorene	mg/kg	0.05	NONE	0.11	0.34
Phenanthrene	mg/kg	0.05	NONE	1	3.3
Anthracene	mg/kg	0.05	NONE	0.22	0.81
Fluoranthene	mg/kg	0.05	NONE	1.5	3.9
Pyrene	mg/kg	0.05	NONE	1.4	3.4
Benzo(a)anthracene	mg/kg	0.05	NONE	0.59	1.4
Chrysene	mg/kg	0.05	NONE	0.69	1.9
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.68	1.7
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.32	0.68
Benzo(a)pyrene	mg/kg	0.05	NONE	0.49	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.2	0.48
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.26	0.52

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	7.61	20.1

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Analytical Report Number: 23-32486
Project / Site name: Stopes Road

Lab Sample Number				2671629	2671630
Sample Reference				6F2 - SP - 11	6F2 - SP - 12
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				04/05/2023	04/05/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.67	0.85
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	38
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	33
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	79
Petroleum Hydrocarbons					
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	NONE	920	1900

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 23-32486
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2671619	6F2 - SP - 1	None Supplied	None Supplied	Brown sand with gravel and stones.
2671620	6F2 - SP - 2	None Supplied	None Supplied	Brown sand with stones.
2671621	6F2 - SP - 3	None Supplied	None Supplied	Brown sand with stones.
2671622	6F2 - SP - 4	None Supplied	None Supplied	Brown sand with stones.
2671623	6F2 - SP - 5	None Supplied	None Supplied	Brown sand with stones.
2671624	6F2 - SP - 6	None Supplied	None Supplied	Brown sand with stones.
2671625	6F2 - SP - 7	None Supplied	None Supplied	Brown sand with stones.
2671626	6F2 - SP - 8	None Supplied	None Supplied	Brown sand with stones.
2671627	6F2 - SP - 9	None Supplied	None Supplied	Brown sand with stones.
2671628	6F2 - SP - 10	None Supplied	None Supplied	Brown sand with stones.
2671629	6F2 - SP - 11	None Supplied	None Supplied	Brown sand with stones.
2671630	6F2 - SP - 12	None Supplied	None Supplied	Brown sand with stones.

Analytical Report Number : 23-32486
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total potential sulphate in soil	Determination of total potential sulphate in soil by calculation from total sulphur.	By calculation - In-house method based on TRL 447 report.	L038-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-32486
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-32500

Replaces Analytical Report Number: 23-32500, issue no. 1
Additional analysis undertaken.
TPH WCG added as per clients request

Project / Site name:	Stopes Road	**Samples received on:**	09/05/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	09/05/2023
Your order number:		**Analysis completed by:**	24/05/2023
Report Issue Number:	2	**Report issued on:**	24/05/2023
Samples Analysed:	10 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 23-32500
Project / Site name: Stopes Road

Lab Sample Number				2671741	2671742	2671743	2671744	2671745
Sample Reference				Type 2-Area 3a-12	Type 2-Area 3a-13	Type 2-Area 3a-14	Type 2-Area 3a-15	Type 2-Area 3a-16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/05/2023	05/05/2023	05/05/2023	05/05/2023	05/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	54	27	26	24	< 0.1
Moisture Content	%	0.01	NONE	8.3	14	14	14	15
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO	PDO	PDO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	6.9	7.4	7.2	7.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sulphide	mg/kg	1	NONE	4.7	6	8.8	5.3	27
Elemental Sulphur	mg/kg	5	NONE	51	140	210	70	76
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.024	0.037	0.038	0.037	0.04
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05	1.2	0.27	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	0.1	0.09	0.07	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	0.27	0.57	0.66	0.09	0.22
Fluorene	mg/kg	0.05	NONE	0.22	0.55	0.55	0.09	0.17
Phenanthrene	mg/kg	0.05	NONE	2.2	5	4.9	0.83	1.9
Anthracene	mg/kg	0.05	NONE	0.47	1.3	1.3	0.2	0.36
Fluoranthene	mg/kg	0.05	NONE	3.1	6.8	6.8	1.4	2.9
Pyrene	mg/kg	0.05	NONE	2.8	6.4	6.3	1.4	2.7
Benzo(a)anthracene	mg/kg	0.05	NONE	1.5	3.7	3.7	0.75	1.3
Chrysene	mg/kg	0.05	NONE	1.5	3.2	3	0.72	1.4
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.6	3.8	3.6	0.85	1.6
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.71	1.6	1.4	0.38	0.52
Benzo(a)pyrene	mg/kg	0.05	NONE	1.3	3.3	3	0.6	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.69	1.8	1.6	0.36	0.46
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.14	0.44	0.34	0.07	0.16
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.84	1.9	1.8	0.38	0.62
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	17.4	41.6	39.2	8.1	15.3
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	25	28	23	26
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.1	1.4	1.2	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	1.2	1.2	0.8	2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	15	17	14	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	47	51	44	50
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	170	96	75	120
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	21	27	23	26

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Analytical Report Number: 23-32500
Project / Site name: Stopes Road

Lab Sample Number				2671741	2671742	2671743	2671744	2671745
Sample Reference				Type 2-Area 3a-12	Type 2-Area 3a-13	Type 2-Area 3a-14	Type 2-Area 3a-15	Type 2-Area 3a-16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/05/2023	05/05/2023	05/05/2023	05/05/2023	05/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	29	35	29	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	62	60	81	58
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	170	250	150	100	62
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	2.7	< 2.0	2.2
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	17	24	22	14	21
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	54	42	27	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	18	28	28	14	26
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	72	70	55	14	26
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	2.6	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	4.7	11	3.8	4.8	2
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	16	40	19	13	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	49	100	52	40	22
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	170	140	120	94	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	69	150	76	58	33
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	240	290	200	150	36

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-32500
Project / Site name: Stopes Road

Lab Sample Number				2671746	2671747	2671748	2671749	2671750
Sample Reference				Type 2-Area 3a-17	Type 2-Area 3a-18	Type 2-Area 3a-19	Type 2-Area 3a-20	Type 2-Area 3a-21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/05/2023	05/05/2023	05/05/2023	05/05/2023	05/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	54	55
Moisture Content	%	0.01	NONE	16	15	12	8.8	10
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO	PDO	PDO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7	7.5	7.4	7.4	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sulphide	mg/kg	1	NONE	9.3	12	6.7	7.3	6.2
Elemental Sulphur	mg/kg	5	NONE	60	59	87	42	53
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.047	0.035	0.03	0.019	0.023
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	0.23	0.17	0.11	0.21	0.09
Fluorene	mg/kg	0.05	NONE	0.18	0.12	0.1	0.2	0.1
Phenanthrene	mg/kg	0.05	NONE	1.6	1.2	1	1.6	0.83
Anthracene	mg/kg	0.05	NONE	0.39	0.24	0.24	0.36	0.2
Fluoranthene	mg/kg	0.05	NONE	2.2	1.8	1.6	1.6	1.3
Pyrene	mg/kg	0.05	NONE	2.1	1.6	1.5	1.4	1.2
Benzo(a)anthracene	mg/kg	0.05	NONE	1	0.89	0.85	0.73	0.71
Chrysene	mg/kg	0.05	NONE	1.2	0.95	0.83	0.69	0.71
Benzo(b)fluoranthene	mg/kg	0.05	NONE	1.2	0.98	0.85	0.73	0.75
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.52	0.38	0.45	0.25	0.28
Benzo(a)pyrene	mg/kg	0.05	NONE	0.9	0.73	0.72	0.56	0.56
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.4	0.31	0.42	0.28	0.34
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.15	< 0.05	< 0.05	0.07	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.53	0.39	0.43	0.34	0.38
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	12.6	9.82	9.08	8.96	7.48
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	27	27	21	16	21
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.7	1.2	0.92	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.7	1.2	0.8	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.6	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	19	15	12	13
Copper (aqua regia extractable)	mg/kg	1	MCERTS	87	55	47	37	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	75	64	47	55
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	32	24	22	22

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Analytical Report Number: 23-32500
Project / Site name: Stopes Road

Lab Sample Number				2671746	2671747	2671748	2671749	2671750
Sample Reference				Type 2-Area 3a-17	Type 2-Area 3a-18	Type 2-Area 3a-19	Type 2-Area 3a-20	Type 2-Area 3a-21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/05/2023	05/05/2023	05/05/2023	05/05/2023	05/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	41	31	23	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63	66	66	64	51
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH\_CU\_1D\_TOTAL}$	mg/kg	10	NONE	50	48	90	25	57
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	NONE	16	15	18	< 8.0	12
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	16	17	19	< 10	14
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	16	17	19	< 10	14
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	NONE	< 2.0	< 2.0	5.8	6.7	2.4
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	< 10	< 10	13	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	NONE	22	19	31	11	20
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4	< 8.4	62	< 8.4	52
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	30	27	51	25	28
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	34	31	110	25	80

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: **23-32500**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2671747	Type 2-Area 3a- 18		132	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 23-32500
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2671741	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with stones.
2671742	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with stones.
2671743	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with stones.
2671744	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with stones.
2671745	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel.
2671746	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel.
2671747	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel.
2671748	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel.
2671749	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel and stones.
2671750	ype 2-Area 3a-	None Supplied	None Supplied	Brown sand with gravel and stones.

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Analytical Report Number : 23-32500
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Elemental sulphur in soil	Determination of elemental sulphur in soil by extraction in acetonitrile followed by HPLC.	In-house method based on Secondsite Property Holdings Guidance for Assessing and Managing Potential	L021-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

Analytical Report Number : 23-32500
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-35126

Project / Site name:	Stopes Road	**Samples received on:**	22/05/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	22/05/2023
Your order number:		**Analysis completed by:**	25/05/2023
Report Issue Number:	1	**Report issued on:**	25/05/2023
Samples Analysed:	5 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 23-35126
Project / Site name: Stopes Road

Lab Sample Number				2687414	2687415	2687416	2687417	2687418
Sample Reference				H9-Verif-N	H9-Verif-E	H9-Verif-S	H9-Verif-W	H9-Verif-B
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				19/05/2023	19/05/2023	19/05/2023	19/05/2023	19/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Amosite	-	Chrysotile & Amosite	Amosite
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.004	-	0.002	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.004	-	0.002	< 0.001
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	MJN	MJN

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: **23-35126**
Project / Site name: **Stopes Road**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2687415	H9-Verif-E		139	Loose Fibrous Debris	**Amosite**	0.004	**0.004**
2687417	H9-Verif-W		132	Loose Fibrous Debris	**Chrysotile & Amosite**	0.002	**0.002**
2687418	H9-Verif-B		134	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number : 23-35126
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
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Analytical Report Number : 23-37728

Project / Site name:	Stopes Road	**Samples received on:**	06/06/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	06/06/2023
Your order number:		**Analysis completed by:**	13/06/2023
Report Issue Number:	1	**Report issued on:**	13/06/2023
Samples Analysed:	1 soil sample		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 23-37728
Project / Site name: Stopes Road

Lab Sample Number				2703791
Sample Reference				HS2
Sample Number				1.00
Depth (m)				None Supplied
Date Sampled				05/06/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	8.7
Total mass of sample received	kg	0.001	NONE	0.8

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	48
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	150
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	110
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	35
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	310
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	340

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	27
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	110
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	97
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	36
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	230
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	270

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 23-37728
Project / Site name: Stopes Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2703791	HS2	1	None Supplied	Black sand with clinker.

Analytical Report Number : 23-37728
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 23-37730

Project / Site name:	Stopes Road	**Samples received on:**	06/06/2023
Your job number:	808	**Samples instructed on/ Analysis started on:**	06/06/2023
Your order number:		**Analysis completed by:**	13/06/2023
Report Issue Number:	1	**Report issued on:**	13/06/2023
Samples Analysed:	1 soil sample		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 23-37730
Project / Site name: Stopes Road

Lab Sample Number				2703794
Sample Reference				HS2-S
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				05/06/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	24
Total mass of sample received	kg	0.001	NONE	0.8

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	9.9
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	17
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44 $_{EH\_CU\_1D\_AL}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	28
TPH-CWG - Aliphatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	28

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	5.1
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	13
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic > EC35 - EC44 $_{EH\_CU\_1D\_AR}$	mg/kg	8.4	NONE	< 8.4
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	24
TPH-CWG - Aromatic (EC5 - EC44) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	24

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Analytical Report Number : 23-37730
Project / Site name: Stopes Road

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2703794	HS2-S	None Supplied	1	Brown clay.

Analytical Report Number : 23-37730
Project / Site name: Stopes Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
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Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
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EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
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2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

APPENDIX G

VHE Hotspot Reports

Combined Hot Spot Validation Report:

Stopes Road, Little Lever, Bolton

Client: Harworth Group

June 2023

Document Issue

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28/2/23	V2	-	IB
19/4/23	V3	HS7 Update.	IB
27/6/23	V4	HS9 & HS2 Update.	IB
06/9/23	V5	Hs4 &HS7 locations updated	SG

Document Issue

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1. Introduction

1.1. Objectives & Brief

Harworth Group Ltd (Harworth) appointed VHE Construction Plc (VHE) as Principal Contractor to undertake the earthworks at Stopes Road, Little Lever, Bolton, BL3 1NP, a former Tarmac block manufacturing facility. The primary objective of the works was to render the site suitable for residential development. A location plan of the site is presented in Figure 1 in appendix A.

A total of five petroleum hydrocarbon hotspots have been identified on site. Two of which are detailed in the Hydrock Remediation Plan (Hydrock Drawing 15220-HYD-XX-XX-DR-GE-1017) and were identified before VHE's works were undertaken. Hotspot 1 correlated to historical TP206 and WS01, Hotspot 2 correlates to TT03A. Hotspot 2 was excavated and validated by Hydrock prior to VHE commencing works on site. A further three hydrocarbon hotspots have been identified during the works (HS4, HS7, HS8).

A total of four asbestos hotspots have been identified on site. One of which has been identified on site prior to VHE's works commencing and is detailed in section 3.2.5 'Asbestos' of the Hydrock Remediation Strategy and Verification Plan. This hotspot has been labelled as HS3 and correlates to historical RO12 where asbestos was observed from 0.1m to 0.2m bgl in the form of amosite sheeting/board debris. A further four asbestos hotspots have been identified during the works (HS5, HS6, HS8 and HS9).

The main objectives of this report are:

- To detail the hotspot excavation and validation works undertaken by VHE;
- To provide verification that the works have been undertaken in accordance with the relevant specifications;

Excavation and validation was carried out in accordance with the stated requirements in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. Hydrocarbon hotspot excavation works were conducted in accordance with VHE MS009, and asbestos hotspot excavations works were conducted in accordance with VHE MS010, present in Appendix 2. A location plan of each hotspot is included in Appendix 1.

All soil chemical analysis was carried out by i2 Analytical Ltd (i2). i2 holds accreditations in accordance with the internationally recognised ISO 17025 Standard and to the UK Environmental Agency's MCERTS Monitoring Certification Scheme for a range of soils and asbestos analysis. The laboratory routinely analyses blank samples as a means of quality control testing.

1.2. Limitations

The information provided within this report and the opinions expressed are based on ground conditions encountered during the works by VHE, previous site investigation reports and on the results of Laboratory and in-situ testing. It should be noted, that there may be physical and chemical conditions pertaining to the site that are not disclosed in this report, for example, within areas that could not be explored due to the presence of live services or exclusion zones.

It should also be noted that not all areas of made ground including asbestos may have been detected during the works, due to the variable thickness of made ground across site and because asbestos often found in discrete locations.

2. Hydrocarbon Hotspots

2.1. Hotspot 1

2.1.1. Excavation works

HS1 was excavated on 07/06/22 and 08/06/22 under the supervision of an experience Geo-Environmental Engineer who coordinated the selective excavation and splitting of the visual and olfactory clean and contaminated materials. The anticipated thickness of the clean overburden and the depth of the contamination was determined by the historical logs and chemical results. The clean overburden was excavated in 0.2m layers until the contaminated layer was exposed. The HS1 excavation measured 10m x 5m and a depth of 2.7m and noted a slight staining and hydrocarbon odour in the excavation. All visual and olfactory hydrocarbon contamination was 'chased out' and fully removed. On completion of the excavation, the hotspot was visually inspected by the Geo-Environmental Engineer and AWP representative to ensure all visual and olfactory evidence of contamination had been removed. Validation samples were then obtained.

All excavated hydrocarbon contaminated materials were loaded directly into a dumper truck and taken to the designated stockpiling area, totalling 29m³ of impacted material, to undergo sampling for further classification. Figure 3 in Appendix 1 shows the location of all validation samples obtained and dispatched for laboratory analysis.

2.1.2. Laboratory Results

A total of 10 validation samples were obtained from the sides and base of the excavation. The results for the validation samples were then screened against the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. Validation results are presented overleaf in Table 1.

Determinand	RTV (mg/kg) 2.5% SOM	HS216-C/1 2.7m	HS216-C/2 1.6m	HS216-N/1 2.7m	HS216-N/2 1.6m	HS216-E/1 2.7m	HS216-E/2 1.6m	HS216-S/1 2.7m	HS216-S/2 1.5m	HS216-W/1 2.7m	HS216-W/2 2.7m
Petroleum Hydrocarbons											
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5
TPH-CWG - Aliphatic >EC12 - EC16	330	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	21	43
TPH-CWG - Aliphatic >EC16 - EC21	550	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	33	52
TPH-CWG - Aliphatic >EC21 - EC35	1500	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	48	67
TPH-CWG - Aliphatic > EC35 - EC44	1500	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	100	170
TPH-CWG - Aliphatic (EC5 - EC44)		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	100	170
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	28	43
TPH-CWG - Aromatic >EC16 - EC21	7500	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	87	110
TPH-CWG - Aromatic >EC21 - EC35	7500	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	140	130
TPH-CWG - Aromatic > EC35 - EC44	7500	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	26	20
TPH-CWG - Aromatic (EC5 - EC35)		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	250	290
TPH-CWG - Aromatic (EC5 - EC44)		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	280	310

Table 1 – Validation Laboratory Results - 22-64224-2A

No TPH fractionations were recorded in excess of petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%). Full laboratory certification is presented in Appendix 3.

A total of 3 samples were obtained from the material excavated from the hotspot to ascertain the most appropriate course of action to be taken with this material. The material was stockpiled for a number of days and overturned to allow volatilisation and mixed with arising from HS2 (Hydrock excavation and validation. The Environment Agency were notified of these treatment works which were conducted in compliance with RPS 215. The laboratory results for this are presented in table 2 below, with the Laboratory Certification presented in Appendix 3.

Table 2 – Laboratory Results – 22-75380-1

Determinand	RTV (mg/kg) 2.5% SOM	HS-HYD-1	HS-HYD-2	HS-HYD-3
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	29	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	550	85	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	1500	93	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	1500	130	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		210	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)		340	< 10	< 10
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	1
TPH-CWG - Aromatic >EC12 - EC16	59	21	14	11
TPH-CWG - Aromatic >EC16 - EC21	7500	57	47	26
TPH-CWG - Aromatic >EC21 - EC35	7500	100	68	45
TPH-CWG - Aromatic > EC35 - EC44	7500	430	310	340
TPH-CWG - Aromatic (EC5 - EC35)		180	130	83
TPH-CWG - Aromatic (EC5 - EC44)		610	440	430

2.1.3. Conclusion

Visual and olfactory evidence of hydrocarbon contamination was noted during the excavation works, this was removed in its entirety and validations samples of the sides and base of the excavation were obtained. None of the validation samples displayed hydrocarbon concentrations in exceedance of the provided petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan.

Excavated contaminated material was stockpiled separately and lined with visqueen to prevent any cross contamination. This was overturned to allow volatilisation in accordance with RPS215. Samples were obtained from this material and reported no exceedances of the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. This material has been reused as fill and placed at a depth of 2.0m bfgl (below finish ground level) in grid squares B18 and B19.

The hotspot can therefore be consider to have been fully delineated with no further risk posed to human health and the surrounding environment.

2.2. Hotspot 2

2.2.1. Excavation works

Hotspot 2 is associated with the tank and fuel lines removed by Hydrock prior to VHE site works. These works are summarised in Hydrock's Technical Design Note 15220-HYD-XX-XX-DR-GE-0014. Hydrocks works were constrained due to the presence high voltage cables in the vicinity of the tanks which resulted in the southern extent of the excavation being ceased before all contaminated material could be removed.

Whilst undertaking excavation works at the site entrance, VHE obtained two validation sample from the southern extent of the mine shaft exclusion zone surrounding shaft 376407-007 boundary to assess the contamination of the soils and if further action was required. The excavation and sampling was overseen by an experienced Geo-Environmental Engineer.

2.2.2. Laboratory Results

A total of 2 validation samples were obtained from the side of the excavation of the material left Insitu. The results of the validation samples were screened against the petroleum hydrocarbon hotspot validation re-use criteria as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. Validation results are present below in Table 3.

Table 3 – Laboratory Results – 23-37728-1 & 23-37730-1

Determinand	RTV (mg/kg) 2.5% SOM	HS2	HS2-S
Petroleum Hydrocarbons			
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	48	9.9
TPH-CWG - Aliphatic >EC16 - EC21	550	150	17
TPH-CWG - Aliphatic >EC21 - EC35	1500	110	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	1500	35	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		310	28
TPH-CWG - Aliphatic (EC5 - EC44)		340	28
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	27	5.1
TPH-CWG - Aromatic >EC16 - EC21	7500	110	13
TPH-CWG - Aromatic >EC21 - EC35	7500	97	< 10
TPH-CWG - Aromatic > EC35 - EC44	7500	36	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)		230	24
TPH-CWG - Aromatic (EC5 - EC44)		270	24

2.2.3. Conclusion

No visual or olfactory evidence of hydrocarbon contamination was noted during the excavation works by VHE. As none of the validation samples displayed hydrocarbon concentrations in exceedance of the provided petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. As these samples were obtained some distance away from the edge of Hydrocks excavation, it is likely contaminated material still exists within the mineshaft exclusion zone. This should be addressed in future site works.

2.3. Hotspot 4

2.3.1. Excavation Works

A further petroleum hydrocarbon hotspot was identified on site during the preclassification sampling located in grid square C13 25m x 25m grid – C16 on 20m x 20m grid. HS4 was excavated on 14/07/22 under the supervision of a Geoenvironmental Engineer who coordinated the selective excavation and splitting of the visual and olfactory clean and contaminated materials. The anticipated thickness of the clean overburden and the depth of the contamination was determined by the logs and chemical results from preclassification sampling. The clean overburden was excavated in 0.2m layers until the contaminated layer was exposed. Minor visual and olfactory contamination was noted in the location, which was removed in its entirety and comprised on 36m^3 of impacted material. The HS4 excavation measured 8m x 8m and a depth of 0.8m. On completion of the excavation, the hotspot was visually inspected by the Geoenvironmental Engineer to ensure all visual and olfactory evidence of contamination had been removed. Validation samples were then obtained.

All hydrocarbon contaminated materials excavated were loaded directly into a dumper truck and taken to the designated stockpiling area to undergo sampling for further classification. Figure 2.4 in Appendix 1 shows the location of all validation samples obtained and dispatched for laboratory analysis.

2.3.2. Laboratory Results

A total of 5 validation samples were obtained from the sides and base of the excavation. The results for the validation samples were then screened against the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. Validation results are presented below in table 4 (referred to as HSC13).

Table 4 – Validation Laboratory Results – Report No 22-72007-1

Determinand	RTV (mg/kg) 2.5% SOM	HSC13-N	HSC13-E	HSC13-S	HSC13-W	HSC13-B
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	< 2.0	7.1	< 2.0	< 2.0	7.1
TPH-CWG - Aliphatic >EC16 - EC21	550	17	20	< 8.0	< 8.0	30
TPH-CWG - Aliphatic >EC21 - EC35	1500	86	150	61	< 8.0	190
TPH-CWG - Aliphatic > EC35 - EC44	1500	49	67	28	< 8.4	61
TPH-CWG - Aliphatic (EC5 - EC35)		100	170	61	< 10	230
TPH-CWG - Aliphatic (EC5 - EC44)		150	240	89	< 10	290
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	13	< 1.0	< 1.0	3.1
TPH-CWG - Aromatic >EC12 - EC16	59	4.4	11	< 2.0	< 2.0	19
TPH-CWG - Aromatic >EC16 - EC21	7500	68	82	12	14	190
TPH-CWG - Aromatic >EC21 - EC35	7500	200	350	56	70	800
TPH-CWG - Aromatic > EC35 - EC44	7500	54	87	37	21	120
TPH-CWG - Aromatic (EC5 - EC35)		270	450	68	84	1000
TPH-CWG - Aromatic (EC5 - EC44)		320	540	100	110	1100

No TPH fractionations were recorded in excess of petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%). Full laboratory certification is presented in Appendix 3.

A total of 3 samples were obtained from the material excavated from the hotspot to ascertain the most appropriate course of action to be taken with this material. The material was stockpiled for a number of days and overturned to allow volatilisation. The Environment Agency were notified of these treatment works which were conducted in compliance with RPS 215. The laboratory results for this are presented in table 5 below, with the Laboratory Certification presented in Appendix 3.

Table 5 – Laboratory Results – Report No 22-75377-1

Determinand	RTV (mg/kg) 2.5% SOM	HS4-C13-1	HS4-C13-2	HS4-C13-3
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	550	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	1500	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	1500	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)		< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	4.6	3.1	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	7500	19	13	19
TPH-CWG - Aromatic >EC21 - EC35	7500	36	28	37
TPH-CWG - Aromatic > EC35 - EC44	7500	< 8.4	< 8.4	10
TPH-CWG - Aromatic (EC5 - EC35)		59	44	56
TPH-CWG - Aromatic (EC5 - EC44)		59	44	66

None of the samples submitted for laboratory analysis reported concentrations in excess of the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan.

2.3.3. Conclusion

Visual and olfactory evidence of hydrocarbon contamination was noted during the excavation works, this was removed in its entirety and validations samples of the sides and base of the excavation were obtained. None of the validation samples displayed hydrocarbon concentrations in exceedance of the provided petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan.

Following treatment, excavated contaminated material reported no exceedances of the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. This material has been reused as fill and placed at a depth of 2.0m bfgl (below finish ground level) in grid squares B18 and B19.

The hotspot can therefore be consider to have been fully delineated with no further risk posed to human health and the surrounding environment.

2.4. Hotspot 7

2.4.1. Excavation Works

HS7 was identified during the excavation works when visual and olfactory evidence of a hydrocarbon impact was noted in grid square D16 in the form of suspected tars. Works were halted in the location and the area treated as a hotspot. HS7 was excavated on 12/09/22 under the supervision of a Geo-environmental Engineer. Visual and olfactory contamination were noted in the location, which was removed in its entirety and comprised of 80m³ of impacted material and placed within a sealed bunded area. The HS7 excavation measured 10m x 7m and a depth of 1.2m. On completion of the excavation, the hotspot was visually inspected by a Geo-environmental Engineer to ensure all visual and olfactory evidence of contamination had been removed. Validation samples were then obtained.

All hydrocarbon contaminated materials excavated were loaded directly into a dumper truck and taken to the designated stockpiling area to undergo sampling for further classification. Figure 2.4 in Appendix 1 shows the location of all validation samples obtained and dispatched for laboratory analysis.

2.4.2. Laboratory Results

A total of 5 validation samples were obtained from the sides and base of the excavation. The results for the validation samples were then screened against the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the

Hydrock Remediation Strategy and Verification Plan. Validation results are presented overleaf in table 6.

Determinand	RTV (mg/kg) 2.5% SOM	HS7-N	HS7-E	HS7-S	HS7-W	HS7-B
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	550	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	1500	13	< 8.0	< 8.0	42	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	1500	< 8.4	< 8.4	< 8.4	20	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		13	< 10	< 10	42	< 10
TPH-CWG - Aliphatic (EC5 - EC44)		13	< 10	< 10	62	< 10
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	13	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	7500	59	< 10	< 10	15	< 10
TPH-CWG - Aromatic >EC21 - EC35	7500	130	< 10	< 10	57	< 10
TPH-CWG - Aromatic > EC35 - EC44	7500	72	< 8.4	< 8.4	31	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)		200	< 10	< 10	72	< 10
TPH-CWG - Aromatic (EC5 - EC44)		270	< 10	< 10	100	< 10

Table 6 – Validation Laboratory Results – Report No 22-83661-1

No TPH fractions were recorded in excess of petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%). Full laboratory certification is presented in Appendix 3.

A total of 4 samples were obtained from the material excavated from the hotspot to ascertain the most appropriate course of action to be taken with this material. The material has been stockpiled and overturned to allow volatilisation multiple times. In addition to the overturning, it has been spread thinly and modified with lime before being re-stockpiled. The Environment Agency were notified of these treatment works which were conducted in compliance with RPS 215. The validation results are presented below in table 7.

Determinand	RTV (mg/kg) 2.5% SOM	HS7-Verif-1	HS7-Verif-2	HS7-Verif-3	HS7-Verif-4
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	1.3	1.7	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	22	19	25	24
TPH-CWG - Aliphatic >EC16 - EC21	550	94	73	91	96
TPH-CWG - Aliphatic >EC21 - EC35	1500	490	410	510	550
TPH-CWG - Aliphatic > EC35 - EC44	1500	260	130	280	320
TPH-CWG - Aliphatic (EC5 - EC35)	1500	610	510	630	670
TPH-CWG - Aliphatic (EC5 - EC44)	1500	860	640	910	990
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	< 1.0	1.4
TPH-CWG - Aromatic >EC12 - EC16	59	24	19	20	26
TPH-CWG - Aromatic >EC16 - EC21	7500	240	200	200	240
TPH-CWG - Aromatic >EC21 - EC35	7500	600	450	450	560
TPH-CWG - Aromatic > EC35 - EC44	7500	160	130	140	160
TPH-CWG - Aromatic (EC5 - EC35)	7500	860	670	670	830
TPH-CWG - Aromatic (EC5 - EC44)	7500	1000	800	800	980

Table 7 – Validation Laboratory Results – Report No 23-27432-1

No TPH fractions were recorded in excess of the petroleum hydrocarbon hotspot validation re-use criteria. The report is presented in Appendix 3.

2.4.3. Conclusion

Visual and olfactory evidence of hydrocarbon contamination was noted during the excavation works, this was removed in its entirety and validations samples of the sides and base of the excavation were obtained. None of the insitu validation samples displayed hydrocarbon concentrations in exceedance of the provided petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan.

Excavated contaminated material was stockpiled separately and lined with Visqueen to prevent cross contamination with material on site.

The hotspot location can therefore be considered to have been fully delineated with no further risk posed to human health and the surrounding environment and the contaminated material left has been isolated on site.

The Validation results showed no TPH fractions were recorded in excess of petroleum hydrocarbon hotspot validation re-use criteria, therefore we intend to place the HS7 soils at depth in the adjacent 3m dig area pending Hydrock's approval.

3. Asbestos Hotspots

All Air Monitoring Certificates and Consignment Notes related to the Asbestos works can be found in Appendix 2.

3.1. Hotspot 3

3.1.1. Excavation works

HS3 was excavated on 09/06/22 under the supervision of an experienced Geo-Environmental Engineer who coordinated the excavation and segregation of asbestos impacted soils. An area of 8m x 9m overlying RO12 was excavated to a depth of 0.5m, a volume of 28m³ of clean overburden was excavated and stockpiled to one side, 12m³ of material containing low levels of visible asbestos cement was stockpiled separately and sheeted within close proximity to the hotspot to reduce the plant requirement for the task. Validation samples were then obtained from the side and base of the excavation. Heras fencing with ample signage was erected surrounding both the excavation and sheeted asbestos containing material. Photographs of the excavation can be seen in Appendix 4.

Asbestos air monitoring was conducted during the works. This reported an airborne fibre concentration of <0.005F/ml which is indistinguishable to ambient fibre levels. A copy of the report is provided in Appendix 3.

Figure 2.2 in Appendix 1 Shows the locations of all validation samples obtained and dispatched for laboratory analysis.

3.1.2. **Laboratory Results**

A total of 5 validation samples were obtained from the sides and base of the excavation. The results for the validation samples are presented overleaf in Table 8.

Parameter	HS3-C 0.5m	HS3-N 0.5m	HS3-E 0.5m	HS3-S 0.5m	HS3-W 0.5m
Asbestos in Soil Screen / Identification Name	-	-	-	-	-
Asbestos in Soil	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	-	-	-	-	-
Asbestos Quantification Total	-	-	-	-	-

Table 8 – Validation Laboratory Results – Report No 22-64224-2B

No asbestos was detected in validation samples dispatched for laboratory analysis. Laboratory certification is presented in Appendix 3.

Arisings from HS3 were then hand by a suitably qualified subcontractor to remove all visible asbestos fragments on 30/08/22. These were then taken to a suitable disposal facility, organised by the subcontractor. Following the picking works and removal of visible asbestos, the material was resampled to assess the fibre concentration and the suitability of the material for reuse, the results of this are presented below in table 9.

Parameter	HS3-D-1	HS3-D-2	HS3-D-3
Asbestos in Soil Screen / Identification Name	-	-	Chrysotile
Asbestos in Soil	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	-	-	< 0.001
Asbestos Quantification Total	-	-	< 0.001

Table 9 – Validation Laboratory Results – Report No 22-68571-1

3.1.3. Conclusion

None of the validation samples obtained from the sides or base of the excavation reported a positive asbestos identification. Following the picking works and sampling of the residual arisings, this material

was classified as being fit for reuse at depth. As such, this material was placed in grid squares B18 and B19 at a depth of 2.0m below finish ground level.

3.2. Hotspot 5

3.2.1. Excavation Works

HS5 was discovered during the works when asbestos cement sheeting was observed in the material. Material containing asbestos was left in situ and the surrounding asbestos-free ground was excavated and used as fill. The material left in situ measured approximately 120m³. Approximately 1000Kg of Asbestos containing material was hand-picked by an appropriately qualified subcontractor between 31/08/22 and 02/09/22. Asbestos removed from the material was then taken to a suitable disposal facility, organised by the subcontractor. As the asbestos containing material was left in situ, no validation samples could be obtained from the walls, but a sample was taken from the base of excavation.

3.2.2. Laboratory Results

Following the picking works and removal of visible asbestos, the material was sampled to assess the fibre concentration and the suitability of the material for reuse, the results of this are presented in table 10.

Table 10 – Validation Laboratory Results – Report No 22-86075-1

Parameter	Post-HS5-1	Post-HS5-2	Post-HS5-B
Asbestos in Soil Screen / Identification Name	-	-	-
Asbestos in Soil	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	-	-	-
Asbestos Quantification Total	-	-	-

3.2.3. Conclusion

Following the picking works and sampling of the arisings, no concentrations of asbestos fibres were detected. As such, this material has been used as fill at depth in the 3m fill area (Area 3).

3.3. Hotspot 6

3.3.1. Excavation Works

HS6 was also discovered during the works when asbestos cement sheeting and small amounts of fibrous lagging were observed in the material. Due to the presence of fibrous lagging, works were suspended and an appropriately qualified subcontractor was contacted to assess the material and provide insight into the most appropriate approach. Due to the small amounts of fibrous asbestos, these works could be carried out as a non-licenced task. Material containing asbestos was left in situ and the surrounding asbestos-free ground was excavated and used as fill. The material left in situ measured approximately 160m³. Approximately 2328Kg of Asbestos containing material was then hand-picked by an appropriately qualified subcontractor between 12/09/22 to 22/09/22. Asbestos removed from the material was then taken to a suitable disposal facility, organised by the subcontractor. As the asbestos containing material was left in situ, no validation samples were obtained from the sides, but results were obtained for the arisings and base, shown in Appendix 1.

3.3.2. Laboratory Results

Following the picking works and removal of visible asbestos, the material was resampled to assess the fibre concentration and the suitability of the material for reuse, the results of this are presented below in table 11.

Table 11 – Validation Laboratory Results – Report No 22-86075-1

Parameter	Post-HS6-1	Post-HS6-2	Post-HS6-B
Asbestos in Soil Screen / Identification Name	-	Amosite	Amosite
Asbestos in Soil	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	-	< 0.001	< 0.001
Asbestos Quantification Total	-	< 0.001	< 0.001

3.3.3. Conclusion

Following the picking works and sampling of the arisings, concentrations of asbestos fibres were detected at very low concentrations. As such, this material has been classified as fill material for use at depth.

3.4. Hotspot 8

3.4.1. Excavation Works

Hotspot 8 was discovered adjacent to hotspot 7 when asbestos cement sheeting was observed in an isolated area. Material containing asbestos was left in situ and the surrounding asbestos-free ground was excavated and used as fill. The material left in situ measured approximately 13m³. Visible signs of Asbestos containing material were hand-picked by an appropriately qualified subcontractor between 31/08/22 and 02/09/22. Asbestos removed from the material was then taken to a suitable disposal facility, organised by the subcontractor. Validation samples were taken from the arisings, the sides of excavations and the base of excavation.

3.4.2. Laboratory Results

A total of 5 validation samples were obtained from the sides and base of the excavation. The results for the validation samples were then screened against the petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. These validation sample results are presented overleaf in table 12. From the arisings, 2 samples were taken directly and another from the base of where the arisings were stockpiled was sampled. The Results from sampling the arisings and base are presented in Table 13 (Asbestos Results) and Table 14 (Hydrocarbon Results).

Determinand	RTV (mg/kg) 2.5% SOM	HS8-N	HS8-E	HS8-S	HS8-W	HS8-B
Petroleum Hydrocarbons						
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	550	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	1500	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	1500	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)		< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)		< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	7500	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	7500	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	7500	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)		< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)		< 10	< 10	< 10	< 10	< 10

Table 12 – Validation Laboratory Results – Report No 22-92423-1

Table 13 – Validation Laboratory Results – Report No 22-86075-1

Parameter	Post-HS8-1	Post-HS8-2	Post-HS8-B
Asbestos in Soil Screen / Identification Name	Chrysotile & Amosite & Crocidolite	Chrysotile & Amosite	Chrysotile & Amosite
Asbestos in Soil	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	0.308	0.436	0.014
Asbestos Quantification Total	0.308	0.436	0.014

Table 14 – Validation Laboratory Results – Report No 22-86075-1

Determinand	RTV (mg/kg) 2.5% SOM	Post-HS8-1	Post-HS8-2	Post-HS8-B
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6	150	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	300	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	84	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	180	20	18	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	330	66	58	19
TPH-CWG - Aliphatic >EC16 - EC21	550	140	130	53
TPH-CWG - Aliphatic >EC21 - EC35	1500	600	540	240
TPH-CWG - Aliphatic > EC35 - EC44	1500	240	210	84
TPH-CWG - Aliphatic (EC5 - EC35)		830	740	310
TPH-CWG - Aliphatic (EC5 - EC44)		1100	950	390
TPH-CWG - Aromatic >EC5 – EC74	78	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	230	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	65	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	120	13	8.7	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	59	150	140	49
TPH-CWG - Aromatic >EC16 - EC21	7500	1600	1500	440
TPH-CWG - Aromatic >EC21 - EC35	7500	3200	2900	940
TPH-CWG - Aromatic > EC35 - EC44	7500	520	740	270
TPH-CWG - Aromatic (EC5 - EC35)		5000	4600	1400
TPH-CWG - Aromatic (EC5 - EC44)		5500	5300	1700

Full laboratory certification is presented in Appendix 3.

3.4.3. Conclusion

Visual and olfactory evidence of hydrocarbon contamination was noted during the excavation works, this was removed in its entirety and validations samples of the sides and base of the excavation were obtained. None of the insitu validation samples displayed hydrocarbon concentrations in exceedance of the provided petroleum hydrocarbon hotspot validation re-use criteria (residential with plant uptake 2.5%) as detailed in section 6.5 of the Hydrock Remediation Strategy and Verification Plan. The hotspot location can therefore be consider to have been fully delineated with no further risk posed to human health and the surrounding environment.

Excavated contaminated material was stockpiled separately and lined with Visqueen to prevent cross contamination. The testing on the arisings indicated that the TPH values were too high and the Asbestos fibres left in the riddled, hand-picked material exceeded reuse criteria. As the material

failed to meet both hydrocarbon and asbestos reuse criteria, it has been removed from site by a licensed waste disposal plant. The area where HS8 was stockpiled after excavation has been scraped as a detectable trace of asbestos fibres were found in the arising base sample. This scraped material was transferred into the stockpiled arisings and disposed off site to Provectus's Maw green treatment facility under hazardous Waste Consignment.

3.5. Hotspot 9

3.5.1. Excavation Works

Hotspot 9 was found when chemical testing in Area 3 showed detected asbestos above the site limit isolated to a small stockpile on site. The asbestos containing soils were transferred to an area covered with visqueen. A total of 8m³ of asbestos containing material was removed to a suitable disposal facility on 22/5/23, organised by the Site Agent. Validation samples were taken from the sides of excavations and the base of excavation. The relevant consignment notes can be found in Appendix 2.

3.5.2. Laboratory Results

Hotspot 9 arisings were sampled and results are shown in table 15 below. A total of 5 valid samples were obtained from the sides and base of excavation. The results of the validation samples are presented below in table 16.

Table 15 – Arisings Laboratory Results – Report No 23-31376-2

Parameter	Type 2 - Area 4 - 1	Type 2 - Area 4 - 2	Type 2 - Area 4 - 3
Asbestos in Soil Screen / Identification Name	Amosite	Amosite	-
Asbestos in Soil	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	0.39	0.008	-
Asbestos Quantification Total	0.39	0.008	-

Table 16 – Validation Laboratory Results – Report No 23-35126-1

Parameter	HS9-Verif-N	HS9-Verif-E	HS9-Verif-S	HS9-Verif-W	HS9-Verif-B
Asbestos in Soil Screen / Identification Name	-	Amosite	-	Chrysotile & Amosite	Amosite
Asbestos in Soil	Not-detected	Detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	-	0.004	-	0.002	< 0.001
Asbestos Quantification Total	-	0.004	-	0.002	< 0.001

Full laboratory certification is presented in Appendix 3.

3.5.3. Conclusion

As the initial chemical testing results indicated the asbestos amount was above 0.01%, the arisings were deemed unfit for site and separated onto visqueen to prevent cross contamination. Further excavation was overseen by a geo-environmental engineer to confirm all visible traces of ACMs had been removed and validation samples taken from the material left Insitu.

The additional arisings were deemed grossly contaminated and were sent to a certified waste facility.

As the validation samples reported less than 0.01% asbestos in the remaining area, the hotspot is considered to have been removed in its entirety.

4.1 Material Management

Hazardous materials taken offsite, specifically ACMs and hazardous soil (All HS8 & 9 Arisings) were removed by licensed carriers and disposal facilities. Copies of the Waste Management Licenses can be found in Appendix 2.

Table 17 – Material Management.

Material	EWC Code	Quantity	Origin	Disposal	Disposal Facility Details	Waste Carrier Details
Asbestos Containing Materials (ACM's)	170605*	3328kg	Visual handpicked ACMs in Hotspot 5, 6 & 8	Hazardous Landfill	**MCP Environmental ltd.**** Spartan Road, Low Moor, Bradford, BD12 0RY *EPR/UP3498VG*	**MCP Environmental ltd.** Spartan Road, Low Moor, Bradford, BD12 0RY *CBDU184628*
Asbestos Containing Materials (ACM's)	170605*	19T	Hotspot 9 Arisings	Hazardous Landfill	**Whitemoss Landfill Ltd.** Whitemoss Road South, Skelmersdale, WN8 9TH *EPR/DP3639LM/V005*	**City Centre Commericals Ltd.** Tower house, Imonswood IND Park, L33 4XY *CBDU225855*
Contaminated / Hazardous soils	170503*	13m^3	Hotspot 8 Arisings	Soil Treatment Facility	**Provectus soils Management Ltd.** FCC Environment, Maw Green Lane, Crewe, CW1 5NG *EPP/3891EL/A001*	**A1 Services (Manchester) Ltd.** Overman Way, Swinton, Manchester, M27 8BQ *CBDU97331*

* Denotes hazardous waste

**Transfer Destination, Final Destination: Augean Port Clarence, off Huntsman Drive ,Port Clarence, Middlesbrough TS2 1UE

Relevant EA / SEPA Waste Management / Waste Carrier License Number

APPENDIX H

Waste Disposal Records

Part A: Notification Details

The Hazardous Waste Regulations 2005 Consignment Note

Consignment no: VHECON05464

Consignment type: Hazardous

Reference no:

The waste below is to be removed from VHE Construction (Former tarmac site)
Producer address: Slopes Rd, Little Lever, Bolton, BL3 1NP
Contact details:
VHE Construction (Former tarmac site) - 07912 391571
keith.giles@sluckerrecycling.co.uk

The waste will be taken to Valgrove Ind Services
Disposal point address: Exchange Works, Kelvin Way, West Bromwich, West Midlands, B70 7JW
Contact details
Wayne Arrowsmith 0121 525 0757
chris@valgrove.co.uk

Part C: Carriers Certificate

Third party consignment note code:
Collection date: September 14, 2022
Single/multiple collection: Single
Collection number:
Round number:

Vehicle registration or non-mode of transport:
Trailer registration:
Carrier: Jason Aldridge
Carrier address:
Exchange Works, Kelvin Way, West Bromwich, West Midlands, B70 7JW
Carrier registration no/reason for exemption: CBDU79648

Carrier Signature - 14/09/2022 10:44

Part D: Consignor's Certificate

Consignor name: Eddie
On behalf of: VHE Construction (Former tarmac site)
Consignor address
Slopes Rd Little Lever Bolton BL3 1NP

I certify that the information in A, B and C has been completed and is correct, that is registered or exempt and was advised of the appropriate precautionary measu the waste is packaged and labelled correctly and the carrier has been advised of special handling requirements.
I confirm that I have fulfilled my duty to apply the waste hierarchy as required by 12 of the waste(England and Wales) Regulations 2011.
I hereby give my approval, by way of signature, that the work has been complete satisfaction.

Customer Signature - 14/09/2022 10:44

Part E: Consignee Certificate

Consignee Name:
Consignee address: Valgrove Ind Services
Exchange Works, Kelvin Way, West Bromwich, West Midlands, B70 7JW

Vehicle Registration (or non-mode of transport) FJ54 RXP

Where The Consignment Forms Part Of A Multiple Collection, As Identified In Part C, I Certify That The Total Number Of Consignments Forming The Collection Are:
I certify that waste permit/exempt waste operation number KP9433UM authorises the management of the waste described in B at the address given in Part A.

Disposal Signature - 21/09/2022 11:26

Part B: Description Of The Waste

Process giving rise to waste: Civil Engineering Reject

SIC Code: 42990

1 Description: Gas Oil & Water

UN ID:	Shipping: Low Hazard for Transport		UN Class:	Packing Group:			Tunnel Codes:
EWC: 13 07 01	Special handling: Std PPE	Waste QTY (kg): 1700.00	Physical: Liquid	Haz: HP7,HP5	Container Types: Tanker	Container(s):	Unit Weight:
Component: Gas Oil				Concentration: <65%			

Part E: Consignee Certificate - Exended Waste List

Note number: VHECON05464

Note type: Hazardous

Job reference:

	EWC Code	Finished Qty (kg)	R or D Code	Acc
1	13 07 01	1750.00	R09	☑ Accep

Additional Notes

To supply tanker to empty a tank and ibc of diesel and water Ewc Code 130701 05484 Contact Hamish Wilkins 07974 138061

Company Details

Valgrove Industrial Services
Exchange Works
Kelvin Way
West Bromwich
West Midlands
B70 7JW

Gary O'Gara, Mark Birch, Wayne Arrowsmith
0121 525 0757
mark.birch@valgrove.co.uk; wayne.arrowsmith@valgrove.co.uk; christine@valgrove.co.uk

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PART A: Notification details

1 Consignment note code: MCPENV / 10232

2 The waste described below is to be removed from (name, address, postcode):

former Tarmac facility B13 1NP

3 The waste will be taken to (name, address and postcode):

MCP Environmental Bradford BD12 0RY

4 The waste producer was

MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

PART B: Description of the waste

If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: Asbestos Removal

2 SIC for the process giving rise to the waste: 39 . 00 /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
A/C	170605	3ooKg	chrysotile	10 - 15%	Solid	HP7	60 bags
					Solid	HP7	
					Solid	HP7	

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170605	2590	White Asbestos	9	III	CV 13, 28
			9		
			9		

PART C: Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are:

01 09 2022 / YY69 MSX

1 Carrier name: James Winter
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

2 Carrier registration no./reason for exemption: CBDU184628

3 Vehicle registration no. (or mode of transport, if not road): YY69 MSX

Time 12:00

Signature: J. Winter

Date 01 09 2022

PART D: Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: James. Winter

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature: J. Winter

Date 01 09 2022 Time

PART E: Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170605	300Kg	A	D-15

1 I received this waste at the address given in A3 on: Date 01092022 Time 1100

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number:

authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Name: M JACK

On behalf of: MCP ENVIRONMENTAL Spartan Rd Low Moor BD12 0RY

Signature: M

Date 01092022 Time 1600

White Copy: MCP Pink Copy: Client

RF13/2

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PART A Notification details

1 Consignment note code: MCPENV/80773

2 The waste described below is to be removed from (name, address, postcode):

VHE Site Little Lever
BL3 1NP BL3 1NP

3 The waste will be taken to (name, address and postcode):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

4 The waste producer was
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

PART B Description of the waste

Continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: Asbestos Removal

2 SIC for the process giving rise to the waste: 39 . 00

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
cement	170605	200kg	chrysolite	10-15	Solid	HP7	50 bags
					Solid	HP7	
					Solid	HP7	

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170605	2590	white	9	III	CV-13-28
			9		
			9		

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are:
YH19 SWN 31 08 2022

1 Carrier name: B Thornton
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

2 Carrier registration no./reason for exemption: CBDU184628

3 Vehicle registration no. (or mode of transport, if not road): YH19 SWN

Time 1400

Signature:

Date 02.09.2022

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: B Thornton

On behalf of (name, address, postcode, telephone, email, facsimile):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature:

Date 02-09-2022 Time 1600

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170605	200kg	A	D-15

1 I received this waste at the address given in A3 on: Date 02.09.2022 at 1610

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number:
EPR/UP3498VG
authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Name:
On behalf of M JACK
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature:

Date 02-09-2022 Time 1610

White Copy: MCP Pink Copy: Client

RF37/3

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PART A Notification details

1 Consignment note code: MCPENV/80774

2 The waste described below is to be removed from (name, address, postcode):

VHE site little Lever BL3 1NP

3 The waste will be taken to (name, address and postcode):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

4 The waste producer was
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

PART B Description of the waste

If continuation sheet used tick here ☐

1 The process giving rise to the waste(s) was: Asbestos Removal

2 SIC for the process giving rise to the waste: 39 . 00 /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
Cement	170605	250kg	chrysotile	10-15	Solid	HP7	60 Bags
					Solid	HP7	
					Solid	HP7	

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170605	2590	White	9	III	CV-13-28
			9		
			9		

PART C Carriers certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are:
YH19 SWN B109 20/22

1 Carrier name: B Thornton
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

2 Carrier registration no./reason for exemption: CBDU184628

3 Vehicle registration no. (or mode of transport, if not road): YH19 SWN

Time 1400

Signature:

Date 30.08.2022

PART D Consignors certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: B Thornton

On behalf of (name, address, postcode, telephone, email, facsimile):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature:

Date 30.08.2022 Time 1600

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170605	250kg	A	D-15

1 I received this waste at the address given in A3 on: Date 30.08.2022 Time 1550

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number:
EPR/UP3498VG
authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Name:
On behalf of MJACK
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature:

Date 30.08.2022 Time 15[illegible]

White Copy: MCP Pink Copy: Client

RF37/3

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

PART A Notification details

1 Consignment note code: MCPENV/77154

2 The waste described below is to be removed from (name, address, postcode):

Former Tarmac facility BL3 1NP

3 The waste will be taken to (name, address and postcode):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

4 The waste producer was
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

PART B Description of the waste

If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: Asbestos Removal

2 SIC for the process giving rise to the waste: 39 . 00 /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
A/C	170605	25 tons	Chrysotile	10-15%	Solid	HP7	50 bags
					Solid	HP7	
					Solid	HP7	

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170605	2590	White asbestos	9	III	CV13, 28
			9		
			9		

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are:
YY69 MSX 31.8.22 /

1 Carrier name: Levi Tattersall
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

2 Carrier registration no./reason for exemption: CBDU184628

3 Vehicle registration no. (or mode of transport, if not road): YY69 MSX

Time 15:00

Signature: L.T

Date 31/08/2022

PART D Consignors certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: Levi Tattersall

On behalf of (name, address, postcode, telephone, email, facsimile):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature: L.T

Date 31/08/2022 Time

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170605	950 kg	A	D-15

1 I received this waste at the address given in A3 on: Date 31/8/2022 Time 1600

2 Vehicle registration no. (or mode of transport if not road):

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number:
EPR/UP3498VG
authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are:

Name:
On behalf of MJ Peck
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature: MJ

Date 31/8/2022 Time 1600

White Copy: MCP Pink Copy: Client

The Hazardous Waste Regulations 2005: Consignment Note

NIE 001 0004/01

Environment Agency

PART A Notification details

1 Consignment note code: MCPENV/78332

2 The waste described below is to be removed from (name, address, postcode):

FORMER TACMAC
BOLTON
BL3 1NP

3 The waste will be taken to (name, address and postcode):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

4 The waste producer was
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

PART B Description of the waste

If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was: Asbestos Removal

2 SIC for the process giving rise to the waste: 39 . 00 /

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
ASBESTOS WASTE	170605	175	CHRYSOTILE	10-15%	Solid	HP7	4 BAG
					Solid	HP7	
					Solid	HP7	

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170605	2590	WHITE ASBESTOS	9	III	CV 13 28
			9		
			9		

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here ☐)

I certify that I today collected the consignment and that the details in A2, A3 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are:

YR22 FYT 12/9/22 101

1 Carrier name: STEVENAGE
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

2 Carrier registration no./reason for exemption: CBDU184628

3 Vehicle registration no. (or mode of transport, if not road): YR22 FYB

Time 09:15

Signature: _____

Date 12/9/22

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name: [signature]

On behalf of (name, address, postcode, telephone, email, facsimile):
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

Signature: [signature]

Date 12/9/22 Time 16:30

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170105	175	A	D 15

1 I received this waste at the address given in A3 on: Date 12/9/22 Time 17:10

2 Vehicle registration no. (or mode of transport if not road):

Name: [illegible] JACK

3 Where waste is rejected please provide details:

On behalf of
MCP ENVIRONMENTAL
Spartan Road, Low Moor, Bradford, BD12 0RY

I certify that waste permit/exempt waste operation number:

EPR/UP3498VG

authorises the management of the waste described in B at the address given in A3.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of consignments forming the collection are: 01

Signature: [signature]

Date 12/9/22 Time 17:10

White Copy: MCP Pink Copy: Client

RF37/3