

**Environmental
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FACTUAL REPORT

GEO-TECHNICAL
ENVIRONMENTAL

job number J4785/19/E/F	date 19/11/19
site address Red House	
Briestfield Road	
Dewsbury	
WF12 0NX	
written by D. Goodwin	checked by S. P. Rogers
issued by D. Goodwin	

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Factual Report on the Remediation of Coal Workings

Location: Red House, Bristfield Road,
Dewsbury, WF12 0NX.

For: Abode Professional Builders Ltd

Report No. J4785/19/E/F

Report date: November 2019

For and on behalf of **Rogers Geotechnical Services Ltd**

Dan Goodwin EngTech MInstRE
Geotechnical Engineer

Steve Rogers CEng, CGeol, MICE, MCIHT, FGS, ACIEH.
Technical Director

1. Introduction

Abode Professional Builders Ltd are currently developing a site at Bristfield Road, Dewsbury with construction of a new residential dwelling. As a consequence of coal workings being present at shallow depth below the site. As an alternative to grouting and given the relatively limited depth of the workings, the client proposed to remediate the site by excavating to the workings and filling the resulting excavation with local quarried materials.

Throughout this process Rogers Geotechnical Services Ltd provided advice and supervision to the work. This report describes the work undertaken, presents the data obtained and discusses the completed remediation.

2. Limitations

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.



3. Client Proposals

The client had concerns in regard to the economics of grouting the mine workings, particularly as workings were likely to be relatively shallow, deeper workings were not likely to be present.

Further to the above and following consultation with the Coal Authority, the client elected to excavate the site to the underside of the workings and construct the proposed dwelling from that level. This proposal was also discussed with RGS and it was agreed in principal that provided the foundation loads from the dwelling were transmitted to the competent rock below the workings, the risks to the construction could be mitigated.

In addition, local quarried material was graded by RGS laboratory to assess its suitability as a fill material in the development.

4. Laboratory Testing

Local quarried material was graded by RGS laboratory to assess its suitability as a fill material in the development. Particle size distribution (PSD) testing revealed that the supplied gravel material did meet the grading specification set out for 6F2.

Material for subsequent dry density / moisture content relationship testing was regraded to ensure the samples met the specification for 6F2 material. The results from this testing showed that the material had a Maximum Dry Density (MDD) of 1.96 Mg/m³ at an Optimum Moisture Content (OMC) of 8.7%.

It was recommended that should the material be used as an upfill material, it be compacted to 95% of MDD (1.86 Mg/m³) in layers of 300mm.

The laboratory report containing all results from testing conducted on supplied material can be seen at Appendix 1.

5. Plate Load Testing

Due to the nature of this development, it was necessary for RGS to attend site in order to inspect the works, conduct testing and provide guidance during the construction process and on review of in-situ testing results.

A series of 5 visits to conduct plate load testing was undertaken at set stages of the upfill process. The testing conducted at the first 3 visits were done to the plate load (CBR) method and the final 2 visits saw the plate load (maintained) method also introduced alongside the previous CBR method.



The change in testing regime was implemented due to initial CBR results being low and maintained results showing depression in mm at the applied load of foundations (75kN/m² provided by the client) rather than a CBR percentage. Low CBR figures can be attributed to the amount of recent rainfall during and post groundworks causing the material to above the optimum moisture content (OMC) for compaction. Further upfill was observed to be less affected by rainfall due to a grading change agreed with the supplying quarry after the second round of in-situ testing. Less fine material was requested in the grading change while the sandstone gravel fractured during compaction ensuring that the correct level of mechanical interlock was still achieved. All plate load testing reports can be seen at Appendix 2.

6. Discussion

The results of the in-situ testing have concluded that the in-filling of the excavation up to the formation level of the dwelling has taken place in accordance with the recommendations provided by RGS. Moreover, tolerable settlements are likely to occur below a suitably designed raft foundation.

Appropriate fill has therefore been placed within the excavation on competent rock below the level of any workings. Therefore, it is considered that the risk of instability within the construction from shallow mine workings will have been mitigated.

7. References

- British Standards Institution (2015) BS5930: *Code of practice for site investigations*, B.S.I., London.
- British Standards Institution (2015) BS8485: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*, B.S.I., London.
- Building Research Establishment (BRE), BRE 414 (2001), *Protective measures for housing on gas-contaminated land*, BRE Press, Garston.
- Mallet H, Cox L, Wilson S, Corban M, *Good practice on the testing and verification of protection systems for buildings against hazardous ground gases*, CIRIA Report C735.



Appendix 1

Laboratory Test Results

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LABORATORY REPORT

GEOTECHNICAL
ENVIRONMENTAL

job number J4785/19/L	client ref
site address Red house, Briestfield Road Huddersfield	client address Abode Builders Ltd Unit 3b Emley Business Park Huddersfield, HD8 9QY
consultant	
date scheduled 26/07/2019	date issued 06/08/2019
issued by C J Norcliffe	job title Laboratory Manager

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**Schedule of UKAS
Accredited Laboratory Tests**

		Accredited (A)	Unaccredited (U)
1. CLASSIFICATION OF SOIL		BS 1377-2:1990	
1.1 Moisture content determination			
i) Oven drying	Pt 2 : 3.2	A	
ii) Saturation m/c of chalk	Pt 2 : 3.3		U
1.2 Index Properties			
i) Liquid limit – cone penetrometer	Pt 2 : 4.3	A	
ii) Plastic limit	Pt 2 : 5.3	A	
iii) Shrinkage limit	Pt 2 : 6.3		U
iv) Linear shrinkage	Pt 2 : 6.5	A	
1.3 Particle Density			
i) Gas jar	Pt 2 : 8.2		U
ii) Large pyknometer	Pt 2 : 8.3		U
iii) Small pyknometer	Pt 2 : 8.4		U
1.4 Density Tests			
i) Linear measurement	Pt 2 : 7.2	A	
ii) Immersion in water	Pt 2 : 7.3		U
iii) Water displacement	Pt 2 : 7.4		U
iv) Sand replacement	Pt 9 : 2.1, 2.2		U
v) Core cutter	Pt 9 : 2.4		U
1.5 Particle Size Distribution			
i) Dry Sieve	Pt 2 : 9.2	A	
ii) Wet Sieve	Pt 2 : 9.3	A	
iii) Sedimentation by pipette	Pt 2 : 9.4	A	
iv) Sedimentation by hydrometer	Pt 2 : 9.5		U
2. CHEMICAL TESTS		BS 1377-3:2018	
ii) Mass loss on ignition	Pt 3 : 4		U
3. COMPACTION RELATED TESTS		BS 1377-4:1990	
3.1 Dry density/moisture relationship			
i) 2.5kg rammer – 1 litre mould	Pt 4 : 3		U
- CBR mould	Pt 4 : 3		U
ii) 4.5kg rammer – 1 litre mould	Pt 4 : 3		U
- CBR mould	Pt 4 : 3		U
3.2 Moisture Condition Value			
i) Single point test	Pt 4 : 5.4		U
ii) MCV/moisture content relationship	Pt 4 : 5.5		U
3.3 California Bearing Ratio			
i) Undisturbed sample	Pt 5 : 7		U
ii) Recompacted sample	Pt 5 : 7		U
iii) Soaked, inc measurement of swell	Pt 5 : 7		U
4. COMPRESSIBILITY OF SOIL		BS 1377-5:1990	
i) One dimensional consolidation	Pt 5 : 3		U
ii) Swelling pressure test	Pt 5 : 3		U
5. SHEAR STRENGTH OF SOIL		BS 1377-7:1990	
i) Hand shear vane	Makers instructions		U
ii) Shear box (100mm square sample)	BS 1377 : Pt 7 : 4		U
iii) Triaxial – quick undrained	BS 1377 : Pt 7 : 8, 9		U
6. PERMEABILITY			
i) Falling head	K. H. Head Vol 2		U
ii) Constant head	BS 1377 : Pt 6 : 6		U
iii) Triaxial cell	BS 1377 : Pt 6 : 6		U
7. ROCK TESTS			
7.1 Classification Tests			
i) Natural moisture content	-		U
ii) Saturated moisture content	-		U
iii) Natural density	-		U
iv) Porosity	-		U
7.2 Strength Tests			
i) Point load index	ISRM '85		U
ii) Uniaxial compression test	ISRM '81		U

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GEOTECHNICAL LAB RESULTS

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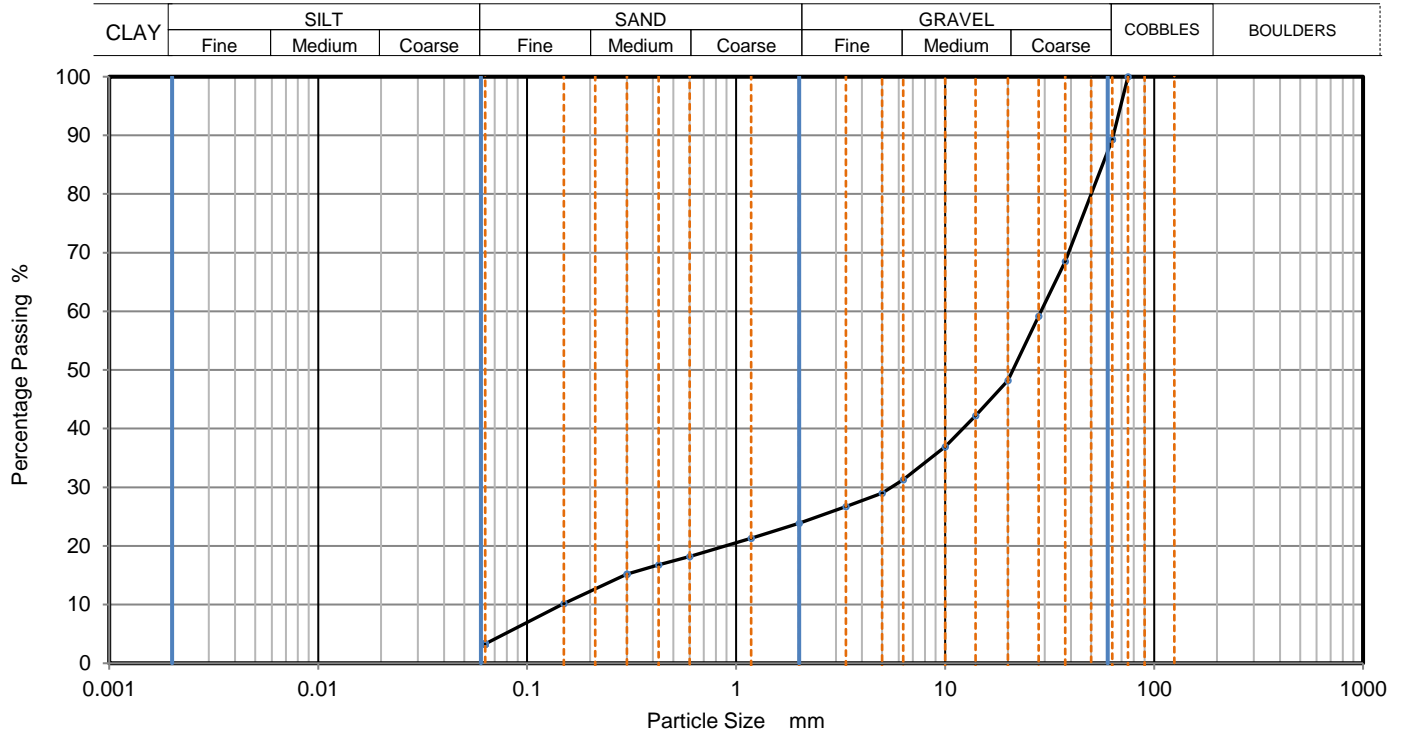
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Company No: 5130864

PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L	
				Borehole/Pit No.	SP1	
Site Name	Red House, Bristfield Rd.			Sample No.	1	
Soil Description	Sandy GRAVEL.			Depth, m	0.00	
Specimen Reference	B1	Specimen Depth	0	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201907293	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	89		
37.5	69		
28	59		
20	48		
14	42		
10	37		
6.3	31		
5	29		
3.35	27		
2	24		
1.18	21		
0.6	18		
0.425	17		
0.3	15		
0.15	10		
0.063	3		

Dry Mass of sample, g 2745

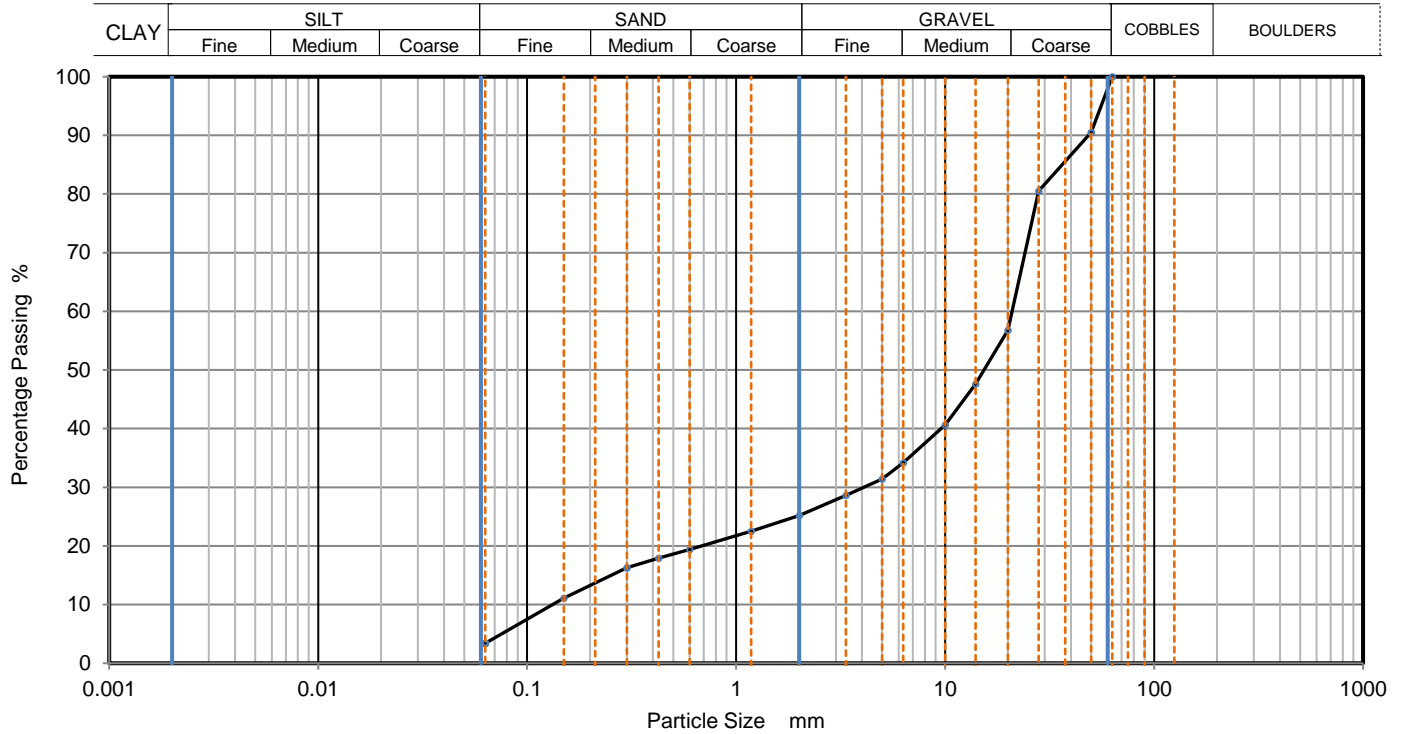
Sample Proportions	% dry mass
Very coarse	11
Gravel	65
Sand	21
Fines <0.063mm	3

Grading Analysis		
D100	mm	75
D60	mm	28.7
D30	mm	5.53
D10	mm	0.147
Uniformity Coefficient		200
Curvature Coefficient		7.2

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Harry	Jude	Jude	06/08/2019	
				Sheet 1

PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L	
				Borehole/Pit No.	SP1	
Site Name	Red House, Bristfield Rd.			Sample No.	2	
Soil Description	Sandy GRAVEL.			Depth, m	0.00	
Specimen Reference	B2	Specimen Depth	0	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201907294	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
63	100		
50	91		
28	81		
20	57		
14	48		
10	41		
6.3	34		
5	31		
3.35	29		
2	25		
1.18	23		
0.6	19		
0.425	18		
0.3	16		
0.15	11		
0.063	3		

Dry Mass of sample, g

3089

Sample Proportions	% dry mass
Very coarse	0
Gravel	75
Sand	22
Fines <0.063mm	3

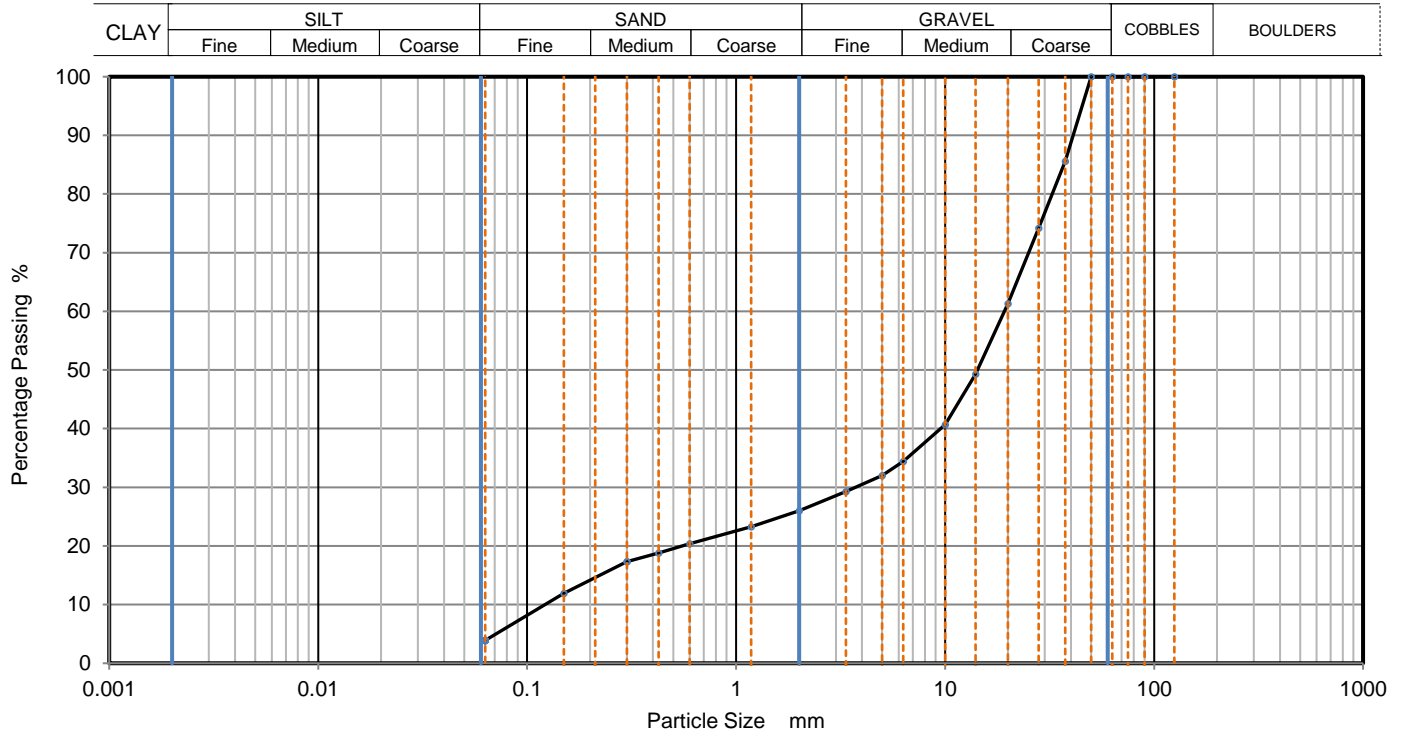
Grading Analysis		
D100	mm	63
D60	mm	20.9
D30	mm	4.11
D10	mm	0.133
Uniformity Coefficient		160
Curvature Coefficient		6.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Harry	Jude	Jude	06/08/2019	
				Sheet 2

PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L
				Borehole/Pit No.	SP1
Site Name	Red House, Bristfield Rd.			Sample No.	3
Soil Description	Sandy GRAVEL.			Depth, m	0.00
Specimen Reference	B3	Specimen Depth	0 m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201907295



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	86		
28	74		
20	61		
14	49		
10	41		
6.3	34		
5	32		
3.35	29		
2	26		
1.18	23		
0.6	20		
0.425	19		
0.3	17		
0.15	12		
0.063	4		

Dry Mass of sample, g

2604

Sample Proportions	% dry mass
Very coarse	0
Gravel	74
Sand	22
Fines <0.063mm	4

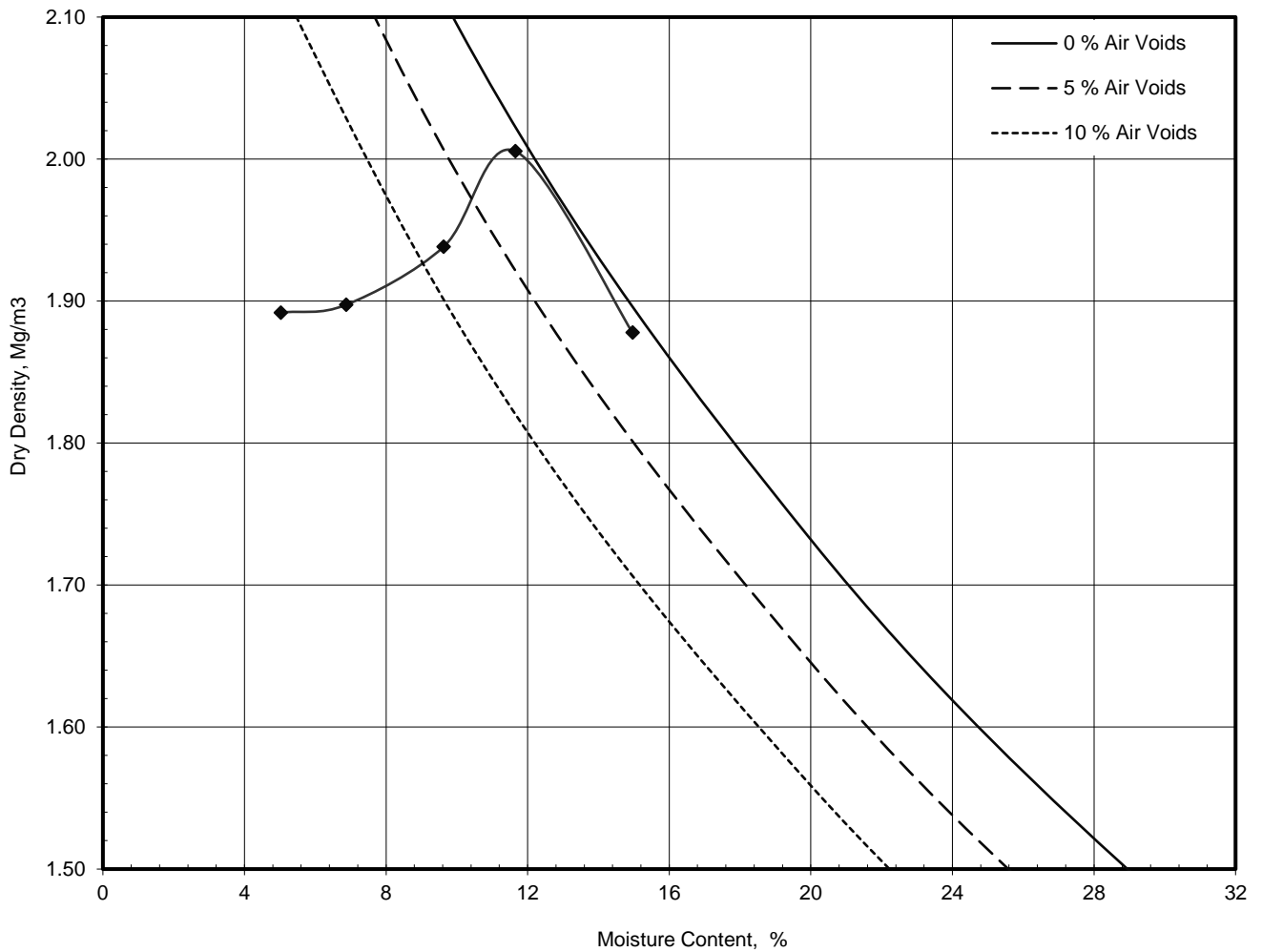
Grading Analysis	
D100	mm
D60	mm 19.2
D30	mm 3.74
D10	mm 0.122
Uniformity Coefficient	160
Curvature Coefficient	6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Harry	Jude	Jude	06/08/2019	
				Sheet 3

Dry Density / Moisture Content Relationship Light Compaction			Job Ref	J4785/19/L	
			Borehole / Pit No	SP1	
Site Name	Red House, Bristfield Rd.		Sample No	B 1-3	
Soil Description	Sandy GRAVEL.		Depth	0.00 m	
Specimen Ref.	B1 to 3	Specimen Depth	n/a m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer		Keylab ID	RGS_201907296	
Compaction Test Reference/No.				MC/OD1	



Preparation	Material used was natural and oven dried at 105 degC	
Mould Type	CBR	
Samples Used	Separate specimens tested	
Material Retained on 37.5 mm Sieve	%	32
Material Retained on 20.0 mm Sieve	%	16
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	2.01
Optimum Moisture Content	%	9.6

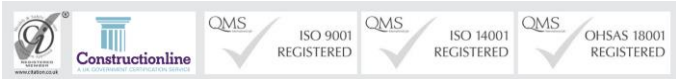
Operator	Checked	Approved	Remarks Sample regraded with 8kg 20mm and 1.1kg 37.5mm added back in.	Fig 2
Dev	Jude	Jude		
				Sheet 1 of 1

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End of Report

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LABORATORY REPORT

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job number J4785/19/L	client ref
site address Red house, Briestfield Road Huddersfield	client address Abode Builders Ltd Unit 3b Emley Business Park Huddersfield, HD8 9QY
consultant	
date scheduled 26/07/2019	date issued 06/08/2019
issued by C J Norcliffe	job title Laboratory Manager

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**Schedule of UKAS
Accredited Laboratory Tests**

		Accredited (A)	Unaccredited (U)
1. CLASSIFICATION OF SOIL		BS 1377-2:1990	
1.1 Moisture content determination			
i) Oven drying	Pt 2 : 3.2	A	
ii) Saturation m/c of chalk	Pt 2 : 3.3		U
1.2 Index Properties			
i) Liquid limit – cone penetrometer	Pt 2 : 4.3	A	
ii) Plastic limit	Pt 2 : 5.3	A	
iii) Shrinkage limit	Pt 2 : 6.3		U
iv) Linear shrinkage	Pt 2 : 6.5	A	
1.3 Particle Density			
i) Gas jar	Pt 2 : 8.2		U
ii) Large pyknometer	Pt 2 : 8.3		U
iii) Small pyknometer	Pt 2 : 8.4		U
1.4 Density Tests			
i) Linear measurement	Pt 2 : 7.2	A	
ii) Immersion in water	Pt 2 : 7.3		U
iii) Water displacement	Pt 2 : 7.4		U
iv) Sand replacement	Pt 9 : 2.1, 2.2		U
v) Core cutter	Pt 9 : 2.4		U
1.5 Particle Size Distribution			
i) Dry Sieve	Pt 2 : 9.2	A	
ii) Wet Sieve	Pt 2 : 9.3	A	
iii) Sedimentation by pipette	Pt 2 : 9.4	A	
iv) Sedimentation by hydrometer	Pt 2 : 9.5		U
2. CHEMICAL TESTS		BS 1377-3:2018	
ii) Mass loss on ignition	Pt 3 : 4		U
3. COMPACTION RELATED TESTS		BS 1377-4:1990	
3.1 Dry density/moisture relationship			
i) 2.5kg rammer – 1 litre mould	Pt 4 : 3		U
- CBR mould	Pt 4 : 3		U
ii) 4.5kg rammer – 1 litre mould	Pt 4 : 3		U
- CBR mould	Pt 4 : 3		U
3.2 Moisture Condition Value			
i) Single point test	Pt 4 : 5.4		U
ii) MCV/moisture content relationship	Pt 4 : 5.5		U
3.3 California Bearing Ratio			
i) Undisturbed sample	Pt 5 : 7		U
ii) Recompacted sample	Pt 5 : 7		U
iii) Soaked, inc measurement of swell	Pt 5 : 7		U
4. COMPRESSIBILITY OF SOIL		BS 1377-5:1990	
i) One dimensional consolidation	Pt 5 : 3		U
ii) Swelling pressure test	Pt 5 : 3		U
5. SHEAR STRENGTH OF SOIL		BS 1377-7:1990	
i) Hand shear vane	Makers instructions		U
ii) Shear box (100mm square sample)	BS 1377 : Pt 7 : 4		U
iii) Triaxial – quick undrained	BS 1377 : Pt 7 : 8, 9		U
6. PERMEABILITY			
i) Falling head	K. H. Head Vol 2		U
ii) Constant head	BS 1377 : Pt 6 : 6		U
iii) Triaxial cell	BS 1377 : Pt 6 : 6		U
7. ROCK TESTS			
7.1 Classification Tests			
i) Natural moisture content	-		U
ii) Saturated moisture content	-		U
iii) Natural density	-		U
iv) Porosity	-		U
7.2 Strength Tests			
i) Point load index	ISRM '85		U
ii) Uniaxial compression test	ISRM '81		U

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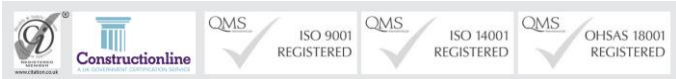
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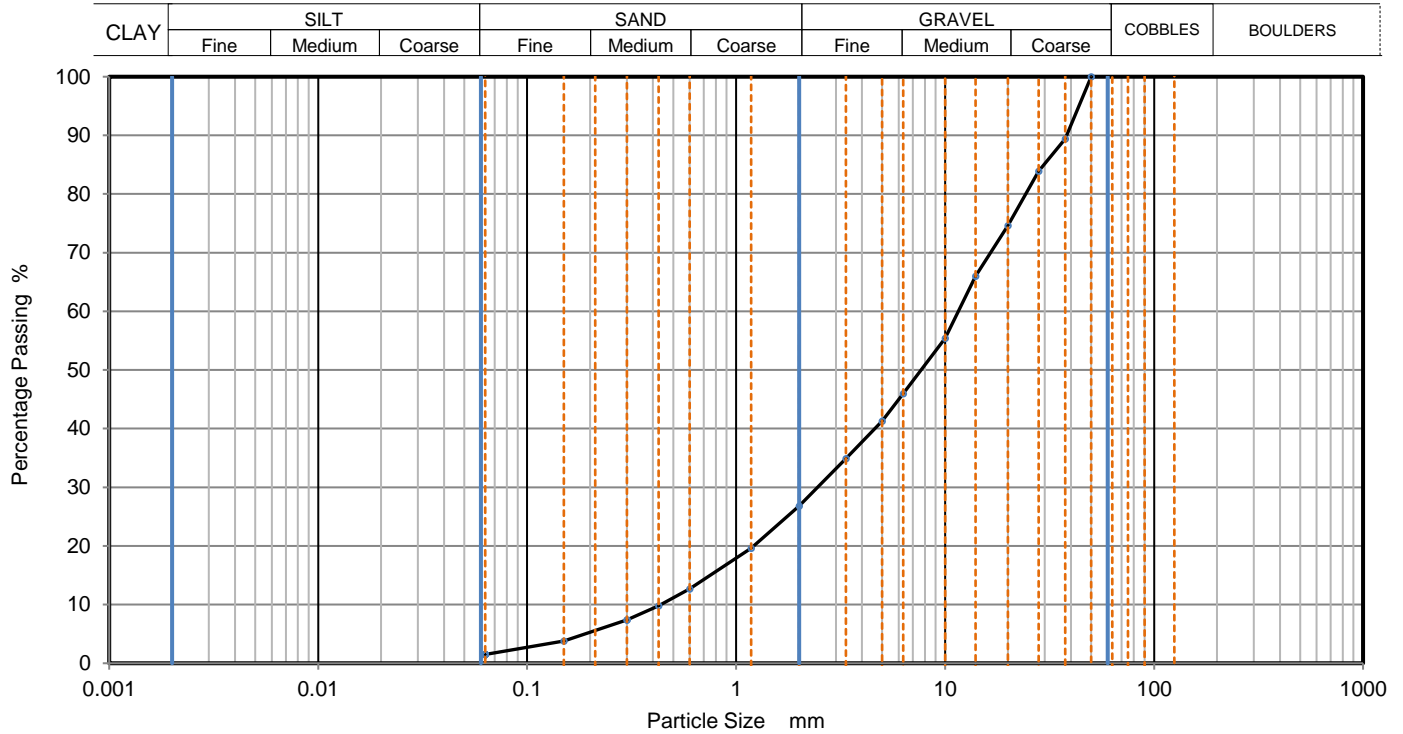
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PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L	
				Borehole/Pit No.	SP2	
Site Name	Red House, Bristfield Rd.			Sample No.	A	
Soil Description	Sandy GRAVEL.			Depth, m	0.00	
Specimen Reference	A	Specimen Depth	0	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201909240	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
50	100		
37.5	89		
28	84		
20	75		
14	66		
10	55		
6.3	46		
5	41		
3.35	35		
2	27		
1.18	20		
0.6	13		
0.425	10		
0.3	7		
0.15	4		
0.063	2		

Dry Mass of sample, g

3494

Sample Proportions	% dry mass
Very coarse	0
Gravel	73
Sand	25
Fines <0.063mm	2

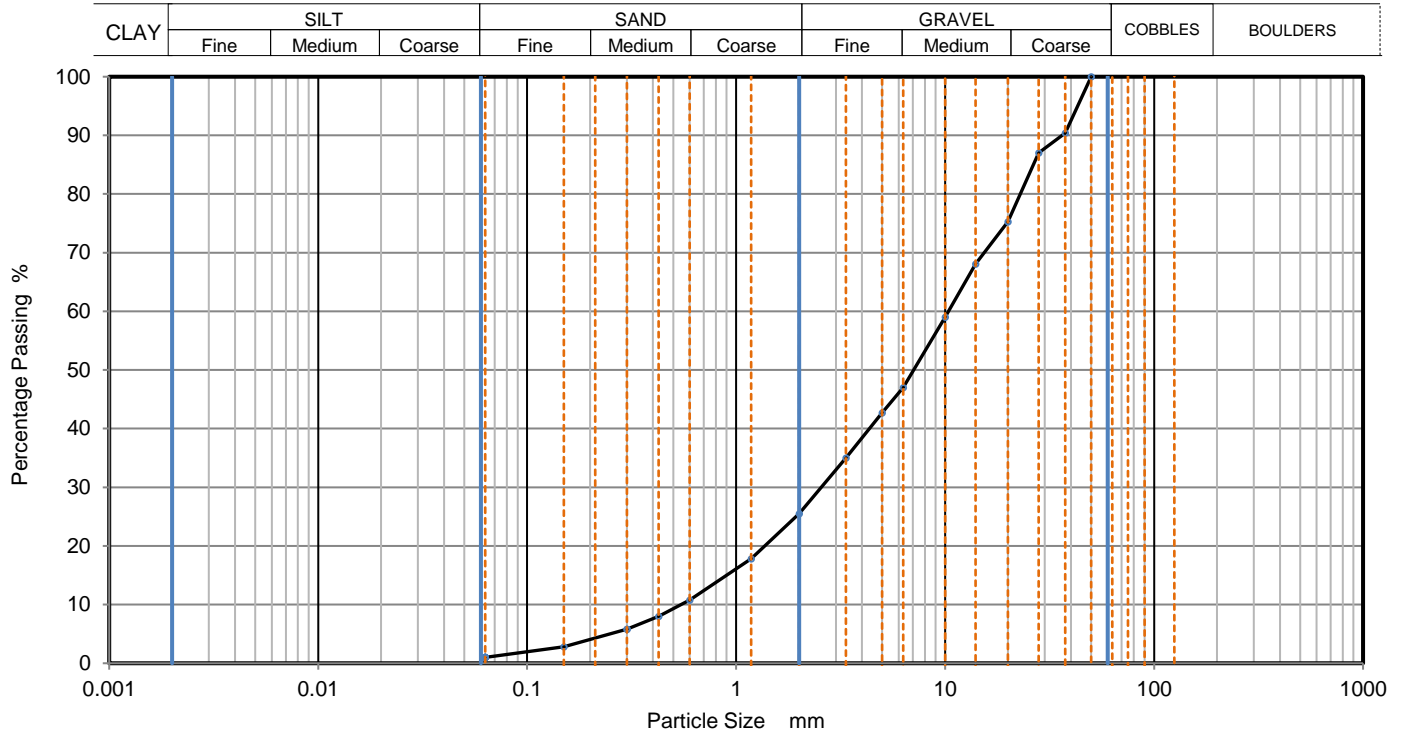
Grading Analysis		
D100	mm	50
D60	mm	11.6
D30	mm	2.45
D10	mm	0.434
Uniformity Coefficient		27
Curvature Coefficient		1.2

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Dev	Jude	Harry	01/10/2019	
				Sheet 1

PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L	
				Borehole/Pit No.	SP2	
Site Name	Red House, Bristfield Rd.			Sample No.	B	
Soil Description	Sandy GRAVEL.			Depth, m	0.00	
Specimen Reference	B	Specimen Depth	0	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201909241	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
50	100		
37.5	90		
28	87		
20	75		
14	68		
10	59		
6.3	47		
5	43		
3.35	35		
2	26		
1.18	18		
0.6	11		
0.425	8		
0.3	6		
0.15	3		
0.063	1		

Dry Mass of sample, g

3298

Sample Proportions	% dry mass
Very coarse	0
Gravel	75
Sand	25
Fines <0.063mm	1

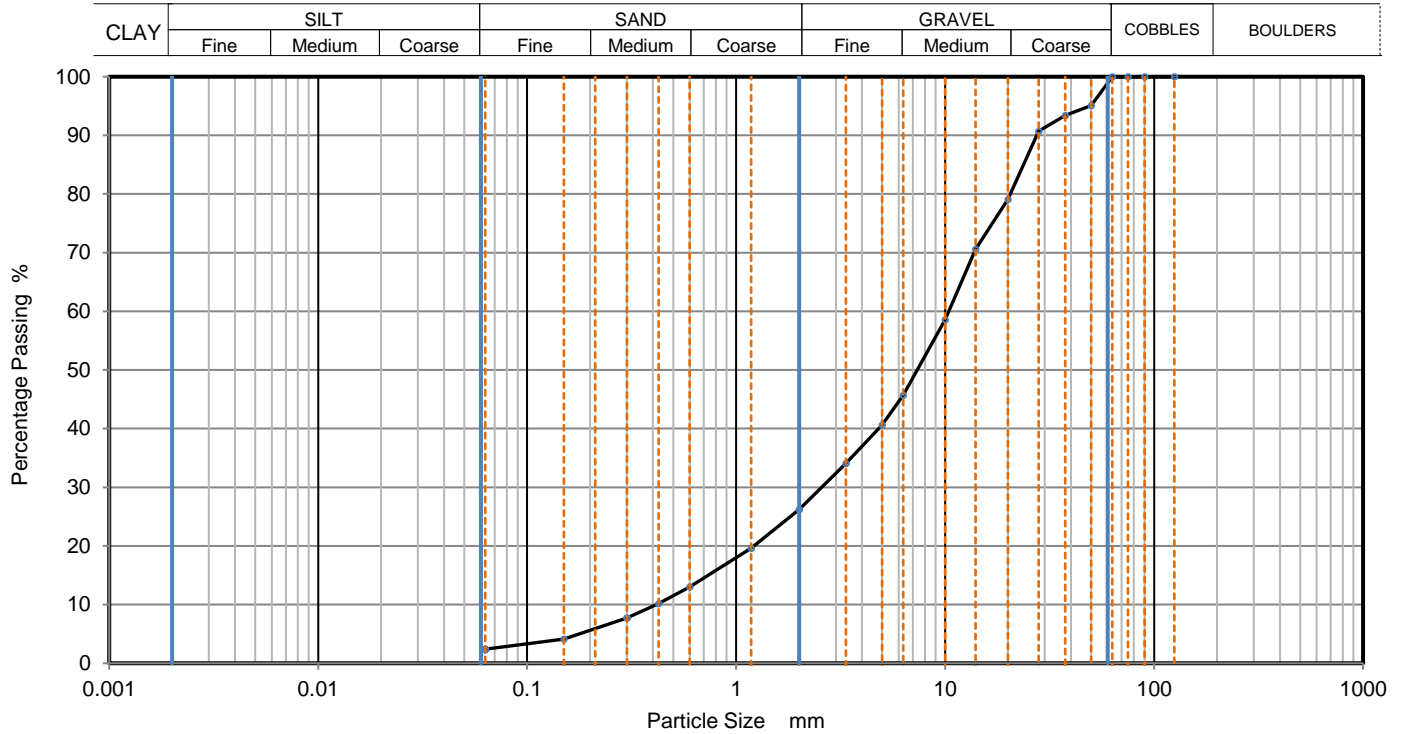
Grading Analysis		
D100	mm	50
D60	mm	10.4
D30	mm	2.55
D10	mm	0.547
Uniformity Coefficient		19
Curvature Coefficient		1.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Dev	Jude	Harry	01/10/2019	
				Sheet 2

PARTICLE SIZE DISTRIBUTION				Job Ref	J4785/19/L
				Borehole/Pit No.	SP2
Site Name	Red House, Bristfield Rd.			Sample No.	C
Soil Description	Sandy GRAVEL.			Depth, m	0.00
Specimen Reference	C	Specimen Depth	0 m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.3			KeyLAB ID	RGS_201909242



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	93		
28	91		
20	79		
14	71		
10	59		
6.3	46		
5	41		
3.35	34		
2	26		
1.18	20		
0.6	13		
0.425	10		
0.3	8		
0.15	4		
0.063	2		

Dry Mass of sample, g

3308

Sample Proportions	% dry mass
Very coarse	0
Gravel	74
Sand	24
Fines <0.063mm	2

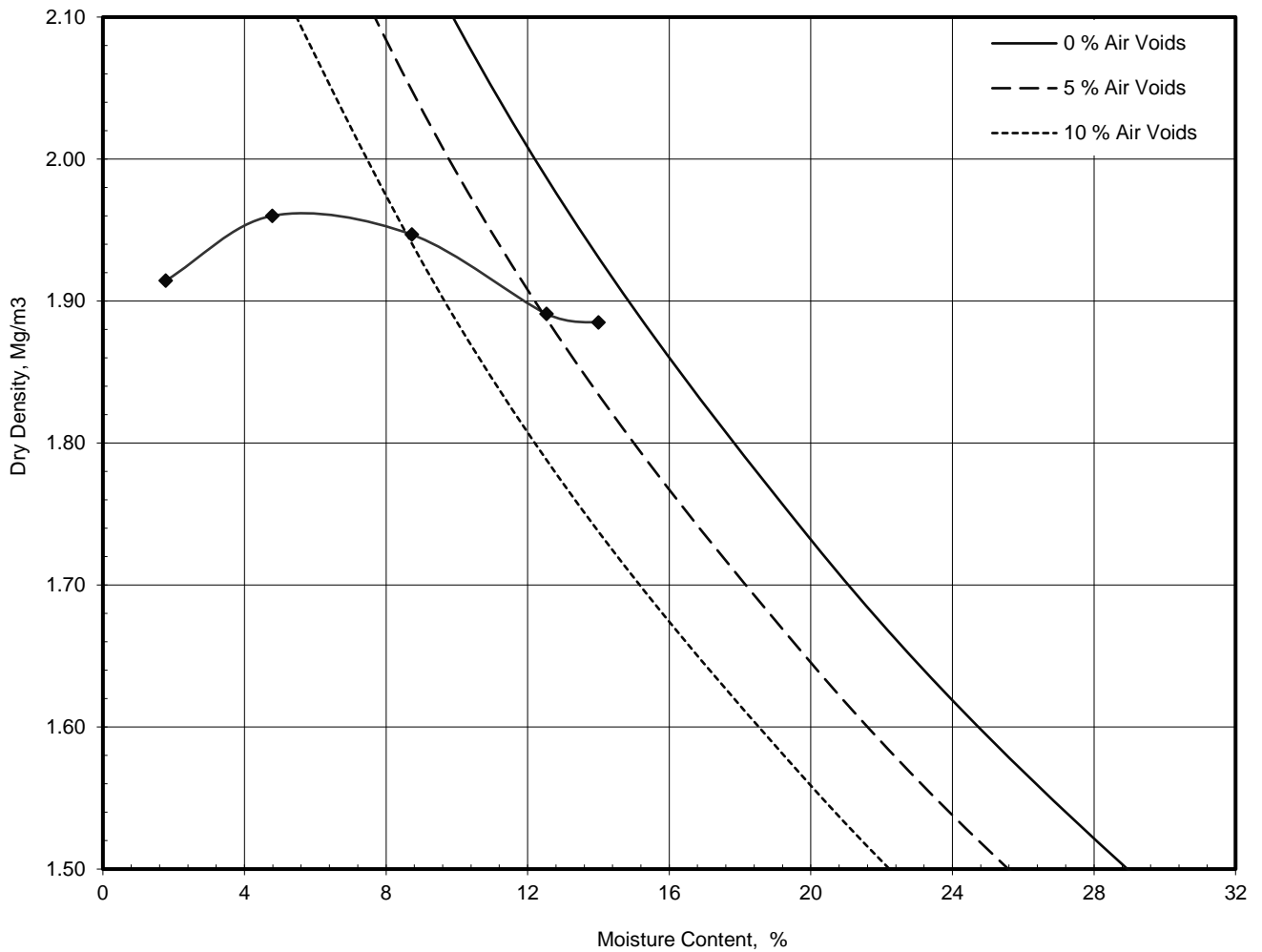
Grading Analysis	
D100	mm
D60	mm 10.4
D30	mm 2.56
D10	mm 0.414
Uniformity Coefficient	25
Curvature Coefficient	1.5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	Fig 1
Dev	Naf	Harry	01/10/2019	
				Sheet 3

	Dry Density / Moisture Content Relationship Light Compaction			Job Ref	J4785/19/L	
				Borehole / Pit No	SP2	
Site Name	Red House, Bristfield Rd.			Sample No	AB&C	
Soil Description	Sandy GRAVEL.			Depth	0.00 m	
Specimen Ref.	AB&C	Specimen Depth	0 m	Sample Type	B	
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer			Keylab ID	RGS_201909243	
					Compaction Test Reference/No.	1



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Separate specimens tested	
Material Retained on 37.5 mm Sieve	%	9
Material Retained on 20.0 mm Sieve	%	17
Particle Density - Assumed	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.96
Optimum Moisture Content	%	8.7

Operator	Checked	Approved	Remarks	Fig 2 Sheet 1 of 1
Harry	Naf	Harry		

Environmental
Geotechnical
Specialists



End of Report

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Company No: 5130864



Appendix 2

In-situ Testing Results

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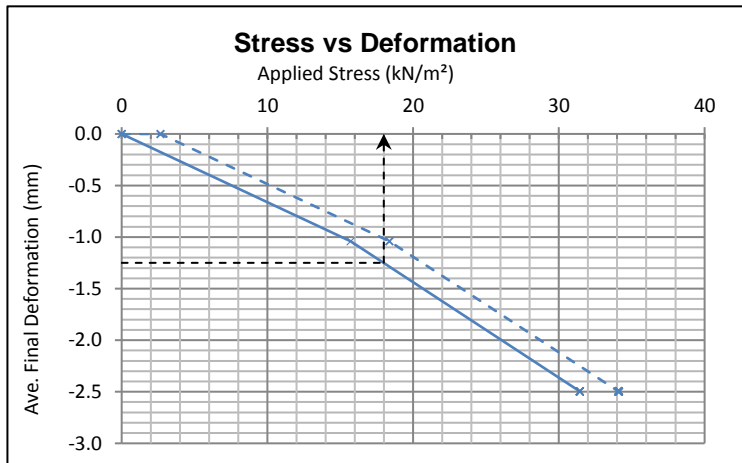
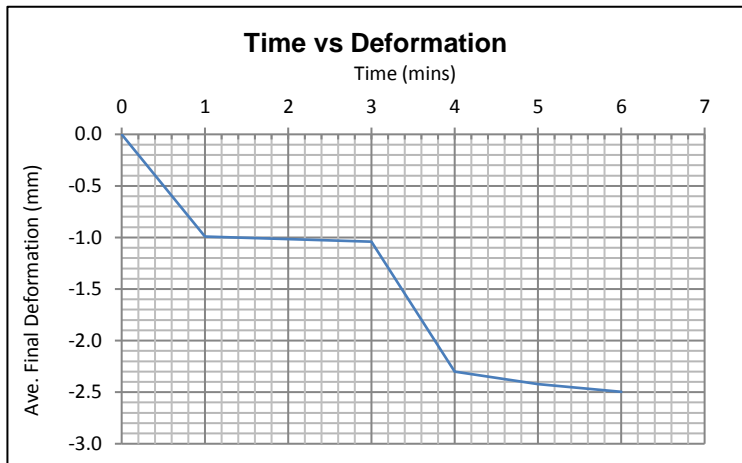
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 15/10/2019	Test Identification: PLT 1

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator		
Test Depth	m	Material under test	Compacted aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-1.04
5	5.42	34.09	-2.50



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	18 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	9 MN/m ² /m
Equivalent CBR by Plate Loading :	0 %
Moisture Content :	- %

Remarks:

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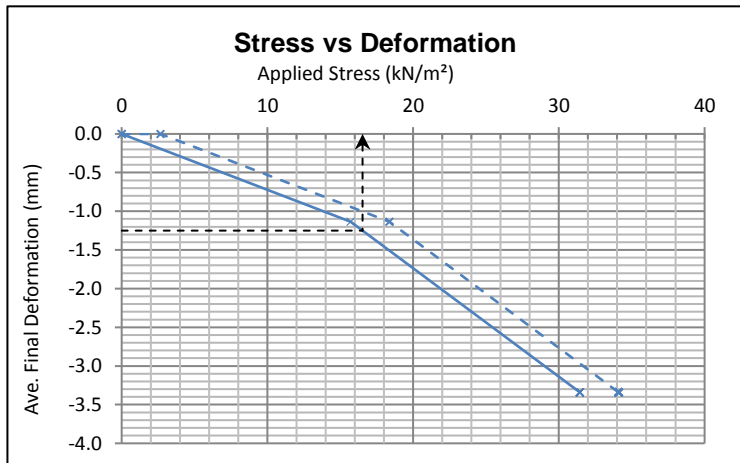
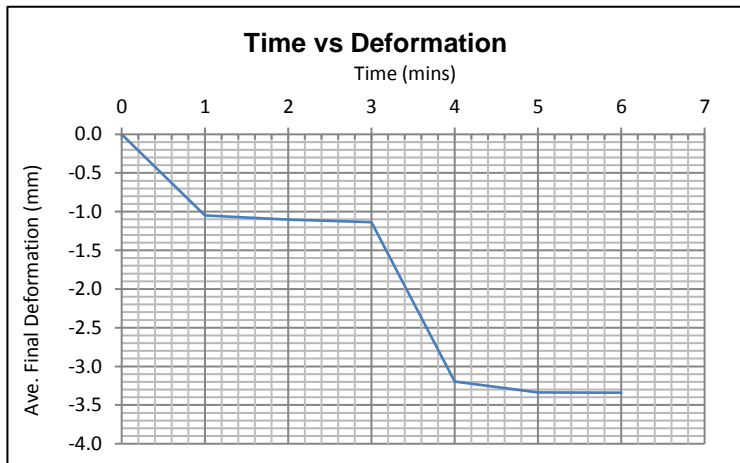
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 15/10/2019	Test Identification: PLT 2

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	22T Tracked Excavator		
Test Depth	m	Material under test	Compacted aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-1.14
5	5.42	34.09	-3.34



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	17 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	8 MN/m ² /m
Equivalent CBR by Plate Loading :	0 %
Moisture Content :	- %

Remarks:

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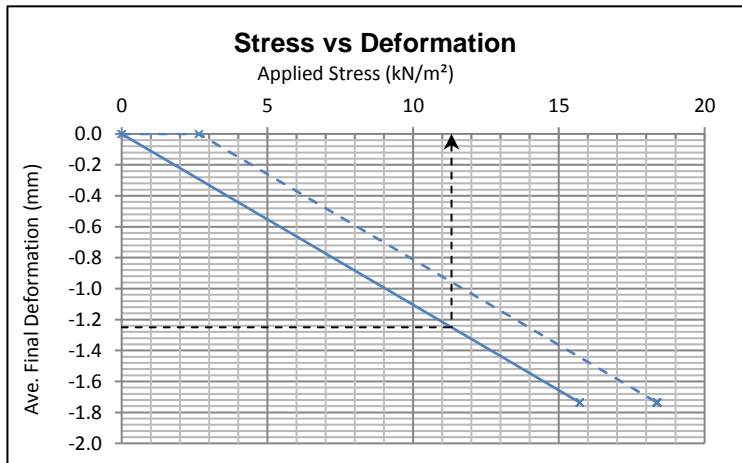
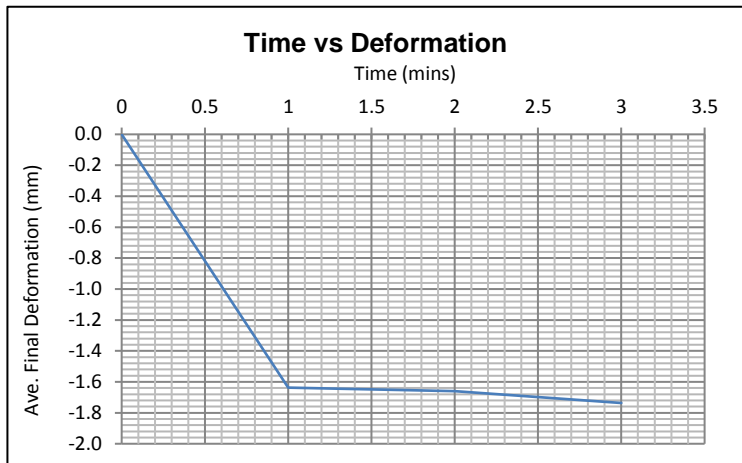
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 15/10/2019	Test Identification: PLT 3

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	21.4T Dozer		
Test Depth	m	Material under test	Compacted aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-1.74



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	11 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	6 MN/m ² /m
Equivalent CBR by Plate Loading :	0 %
Moisture Content :	- %

Remarks:

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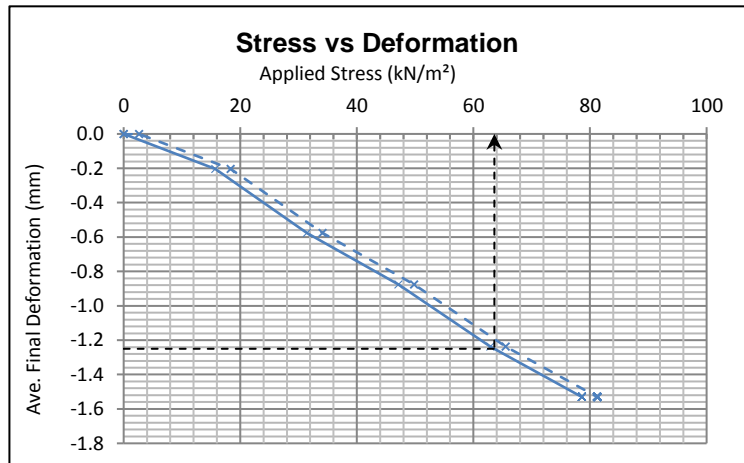
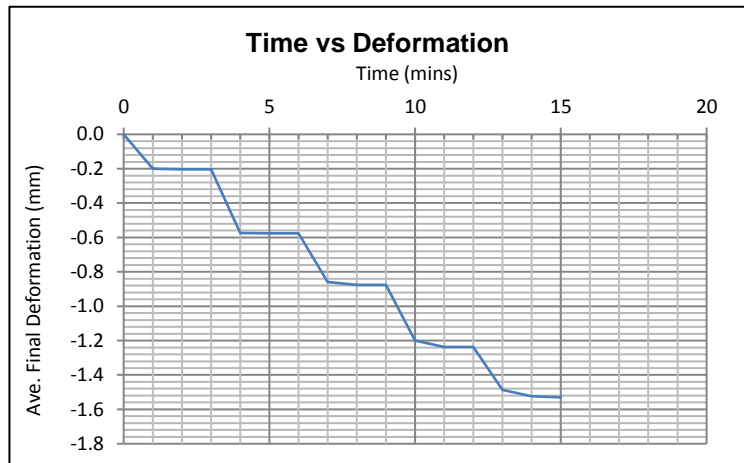
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 21/10/2019	Test Identification: PLT 1

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator			
Test Depth	Second visit	m	Material under test	Compacted aggregate
Description of reaction			Moisture Content of material	- %
Plate Diameter	450	mm	In-situ density of material	- kN/m ³
Plate Area	0.159	m ²	Groundwater level	- m
Mass of test apparatus	43	kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform				m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.20
5	5.42	34.09	-0.58
7.5	7.92	49.81	-0.88
10	10.42	65.53	-1.24
12.5	12.92	81.25	-1.53



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	64 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	32 MN/m ² /m
Equivalent CBR by Plate Loading :	4 %
Moisture Content :	- %

Remarks:

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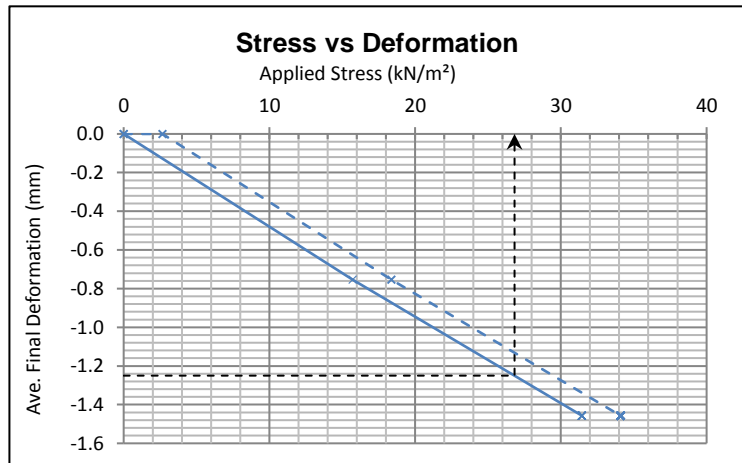
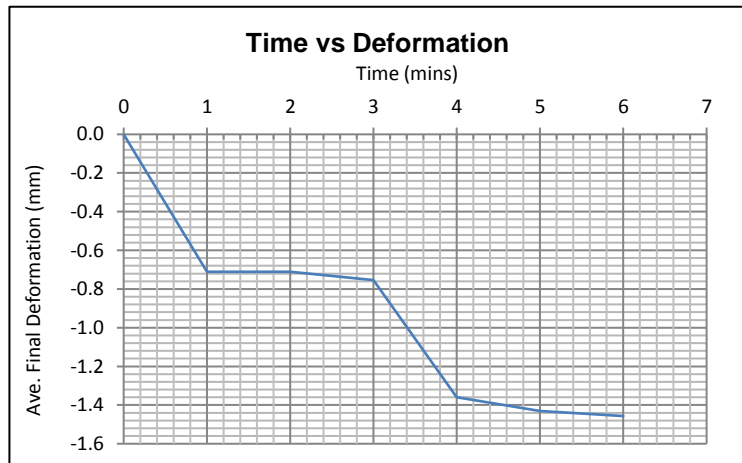
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 21/10/2019	Test Identification: PLT 2

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	22T Tracked Excavator			
Test Depth	Second visit	m	Material under test	Compacted aggregate
Description of reaction			Moisture Content of material	- %
Plate Diameter	450	mm	In-situ density of material	- kN/m ³
Plate Area	0.159	m ²	Groundwater level	- m
Mass of test apparatus	43	kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform				m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.75
5	5.42	34.09	-1.46



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	27 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	13 MN/m ² /m
Equivalent CBR by Plate Loading :	1 %
Moisture Content :	- %

Remarks:

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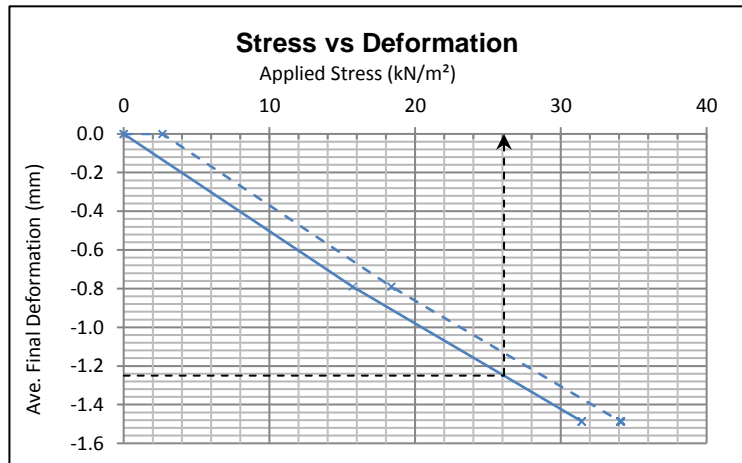
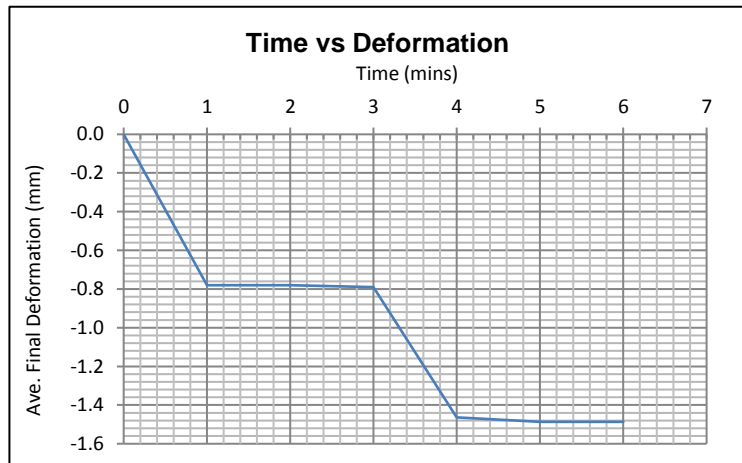
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 21/10/2019	Test Identification: PLT 3

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator			
Test Depth	Second visit	m	Material under test	Compacted aggregate
Description of reaction			Moisture Content of material	- %
Plate Diameter	450	mm	In-situ density of material	- kN/m ³
Plate Area	0.159	m ²	Groundwater level	- m
Mass of test apparatus	43	kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform				m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.79
5	5.42	34.09	-1.49



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	26 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	13 MN/m ² /m
Equivalent CBR by Plate Loading :	1 %
Moisture Content :	- %

Remarks:

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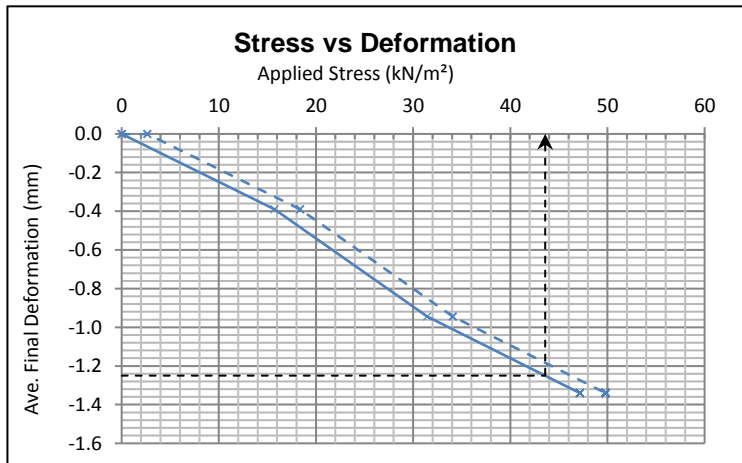
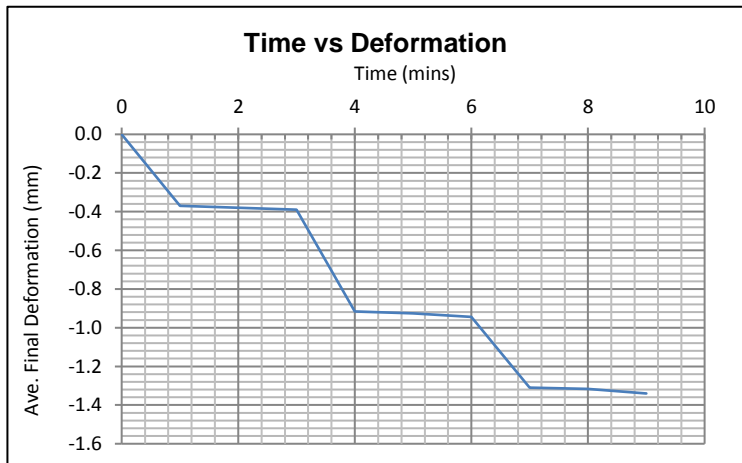
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 23/10/2019	Test Identification: PLT 1

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator		
Test Depth	Third visit	Material under test	Compacted aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Sunny but cold
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.39
5	5.42	34.09	-0.94
7.5	7.92	49.81	-1.34



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	44 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	22 MN/m ² /m
Equivalent CBR by Plate Loading :	2 %
Moisture Content :	- %

Remarks:

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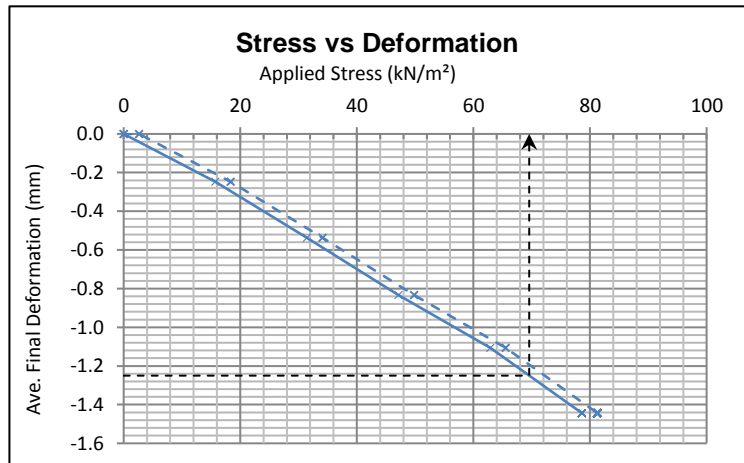
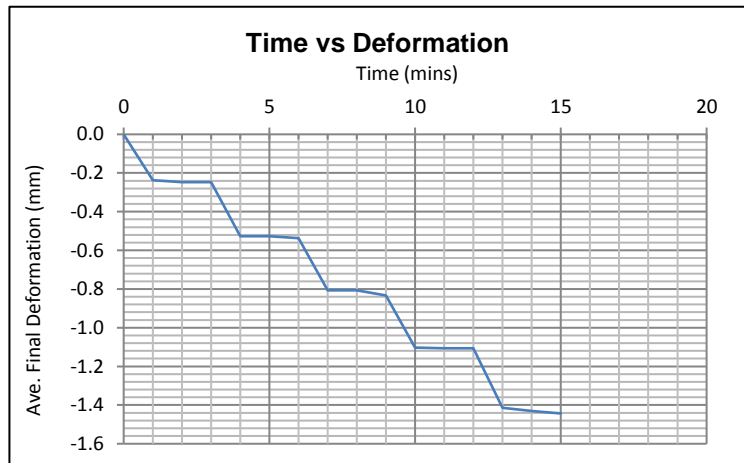
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 23/10/2019	Test Identification: PLT 2

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	22T Tracked Excavator		
Test Depth	Third visit	Material under test	Compacted aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Sunny but cold
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.25
5	5.42	34.09	-0.54
7.5	7.92	49.81	-0.83
10	10.42	65.53	-1.11
12.5	12.92	81.25	-1.44



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	70 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	35 MN/m ² /m
Equivalent CBR by Plate Loading :	5 %
Moisture Content :	- %

Remarks:

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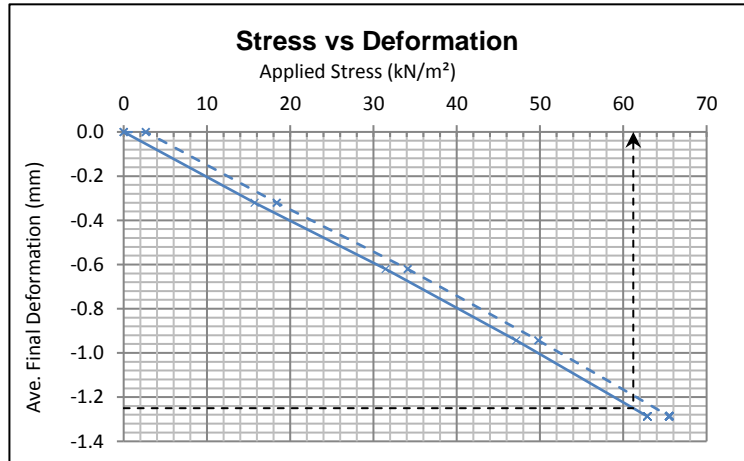
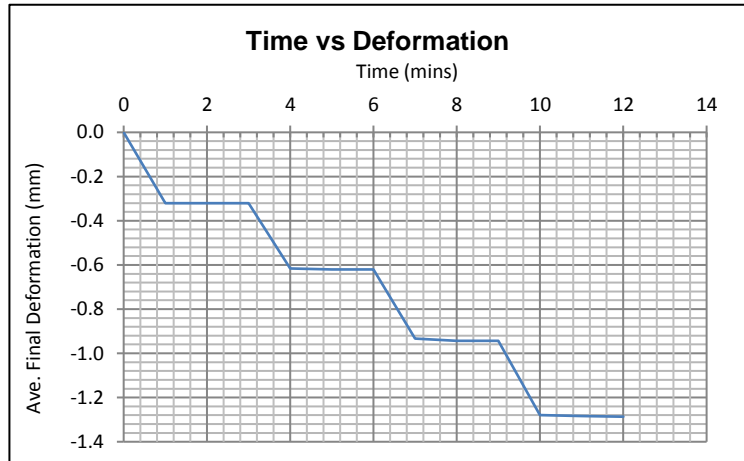
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 25/10/2019	Test Identification: PL 1 (CBR)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator			
Test Depth	4th visit	m	Material under test	Compacted sandstone aggregate
Description of reaction			Moisture Content of material	- %
Plate Diameter	450	mm	In-situ density of material	- kN/m ³
Plate Area	0.159	m ²	Groundwater level	- m
Mass of test apparatus	43	kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform				m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.32
5	5.42	34.09	-0.62
7.5	7.92	49.81	-0.94
10	10.42	65.53	-1.29



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	61 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	31 MN/m ² /m
Equivalent CBR by Plate Loading :	4 %
Moisture Content :	- %

Remarks:

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Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 25/10/2019	Test Identification: PL 1 (Maintained)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator	Design Working Stress	75 kN/m ²
Test Depth	4th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	600 mm	In-situ density of material	- kN/m ³
Plate Area	0.283 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
0	0	1.49	1.99	0.00	0.00	0.00		0.00
1	1	5.03	6.70	0.02	0.15	0.02		-0.06
1	2	5.03	6.70	0.02	0.15	0.02		-0.06
1	3	5.03	6.70	0.02	0.15	0.02		-0.06
1	4	5.03	6.70	0.02	0.15	0.02		-0.06
1	5	5.03	6.70	0.02	0.15	0.02		-0.06
11	6	40.40	53.86	1.10	1.76	0.87		-1.24
11	7	40.40	53.86	1.14	1.80	0.91		-1.28
11	8	40.40	53.86	1.15	1.81	0.92		-1.29
11	9	40.40	53.86	1.15	1.81	0.92		-1.29
11	10	40.40	53.86	1.15	1.81	0.92		-1.29
16	11	58.08	77.44	1.56	2.36	1.29		-1.74
16	12	58.08	77.44	1.58	2.39	1.30		-1.76
16	13	58.08	77.44	1.59	2.39	1.31		-1.76
16	14	58.08	77.44	1.59	2.40	1.31		-1.77
16	15	58.08	77.44	1.59	2.40	1.31		-1.77
22	16	79.30	105.73	2.10	3.04	1.77		-2.30
22	17	79.30	105.73	2.11	3.05	1.78		-2.31
22	18	79.30	105.73	2.11	3.05	1.78		-2.31
22	19	79.30	105.73	2.11	3.05	1.78		-2.31
22	20	79.30	105.73	2.11	3.05	1.78		-2.31
32	21	114.67	152.89	2.87	3.95	2.43		-3.08
32	22	114.67	152.89	2.92	4.01	2.47		-3.13
32	23	114.67	152.89	2.93	4.02	2.48		-3.14
32	24	114.67	152.89	2.94	4.03	2.48		-3.15
32	25	114.67	152.89	2.94	4.03	2.48		-3.15
42.5	26	151.80	202.41	3.65	4.75	3.05		-3.82

Remarks: Dryer material than previous visits due to less fines.

Rogers Geotechnical Services Ltd

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Job No:

J4785/19/E

Sheet:

2

Site:

Briestfield Road

Client:

Abode Builders

Test Date:

25/10/2019

Test Identification:

PL 1 (Maintained)

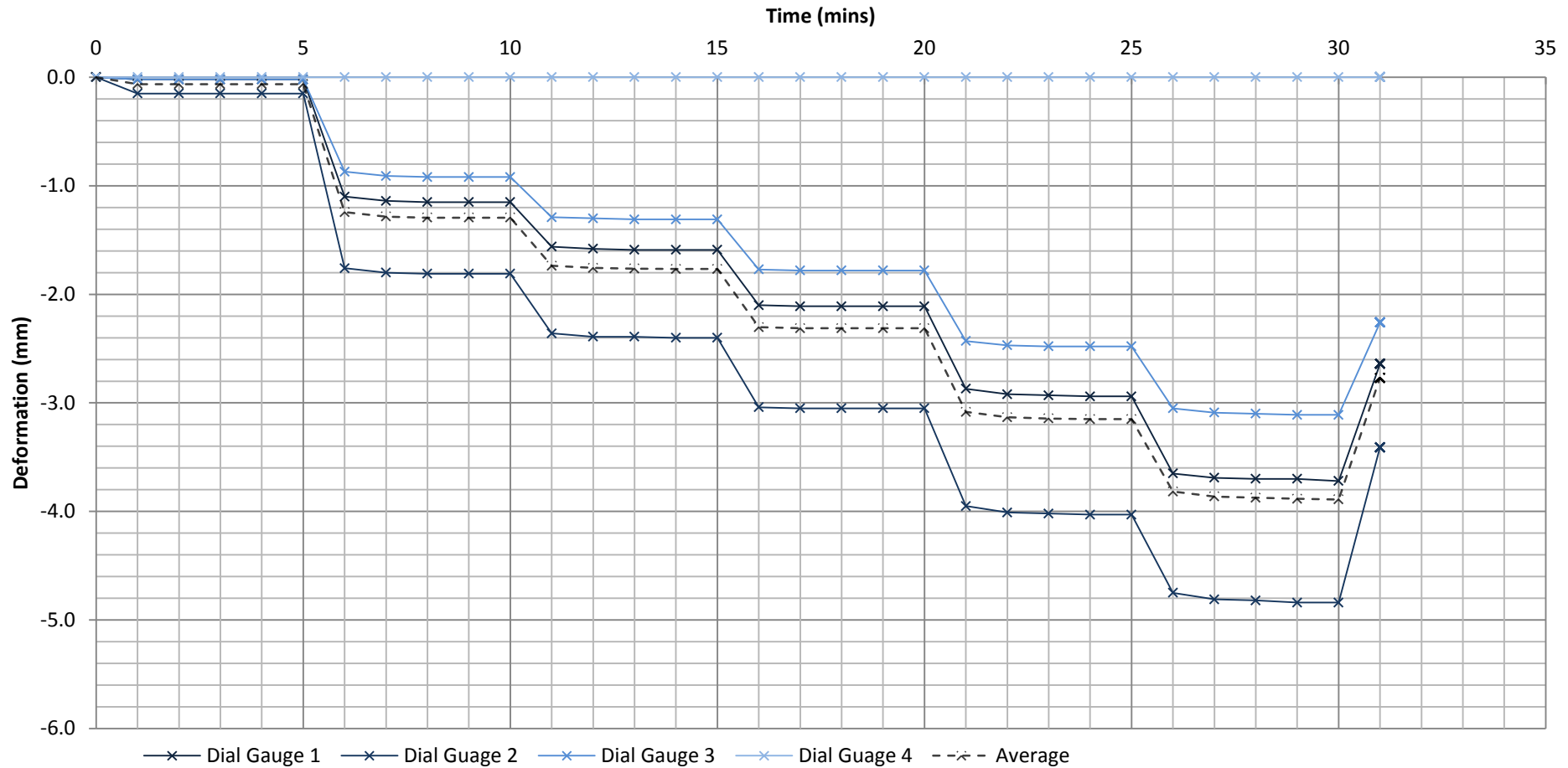
Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
42.5	27	151.80	202.41	3.69	4.81	3.09		-3.86
42.5	28	151.80	202.41	3.70	4.82	3.10		-3.87
42.5	29	151.80	202.41	3.70	4.84	3.11		-3.88
42.5	30	151.80	202.41	3.72	4.84	3.11		-3.89
0	31	1.49	1.99	2.64	3.41	2.26		-2.77

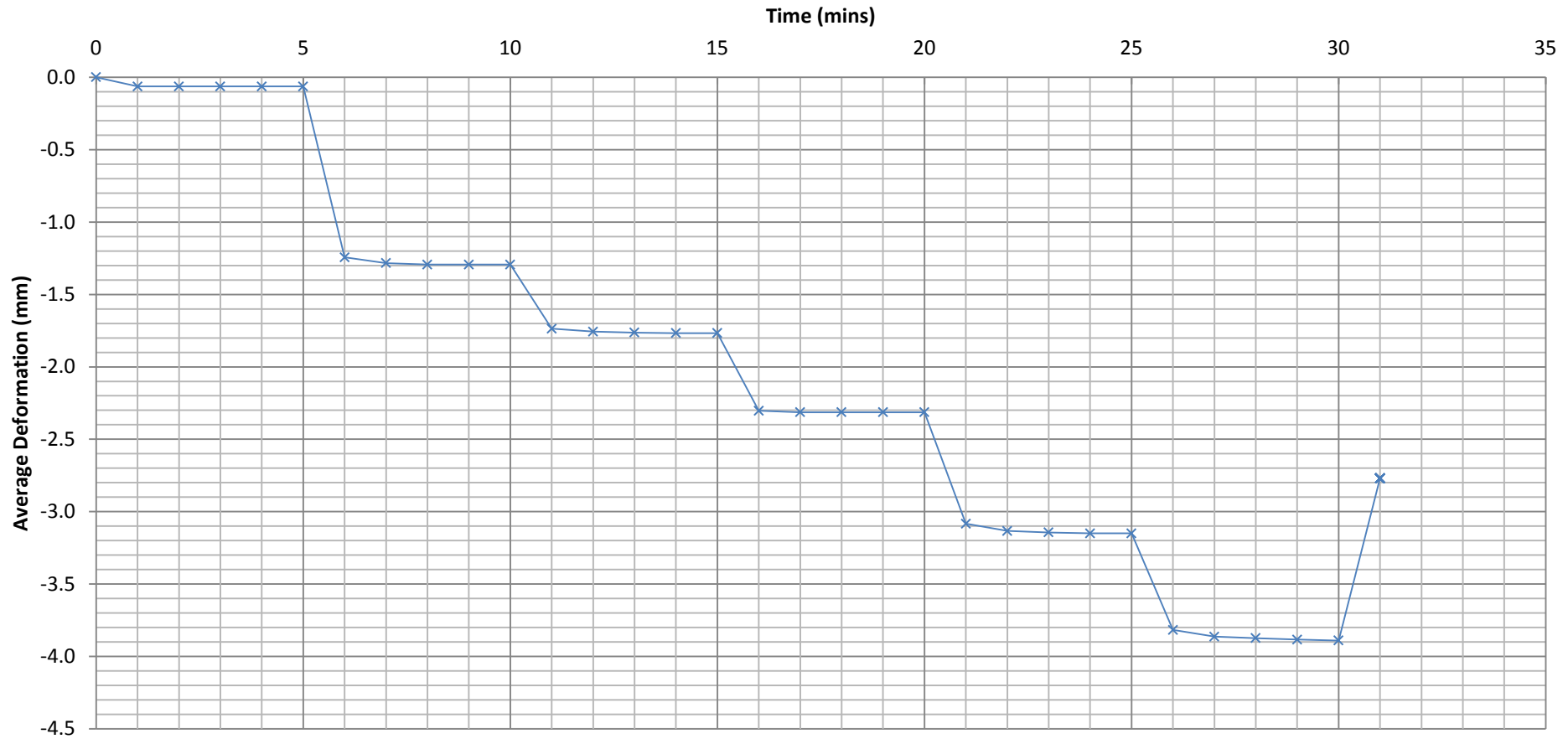
Remarks: Dryer material than previous visits due to less fines.

Time vs Deformation



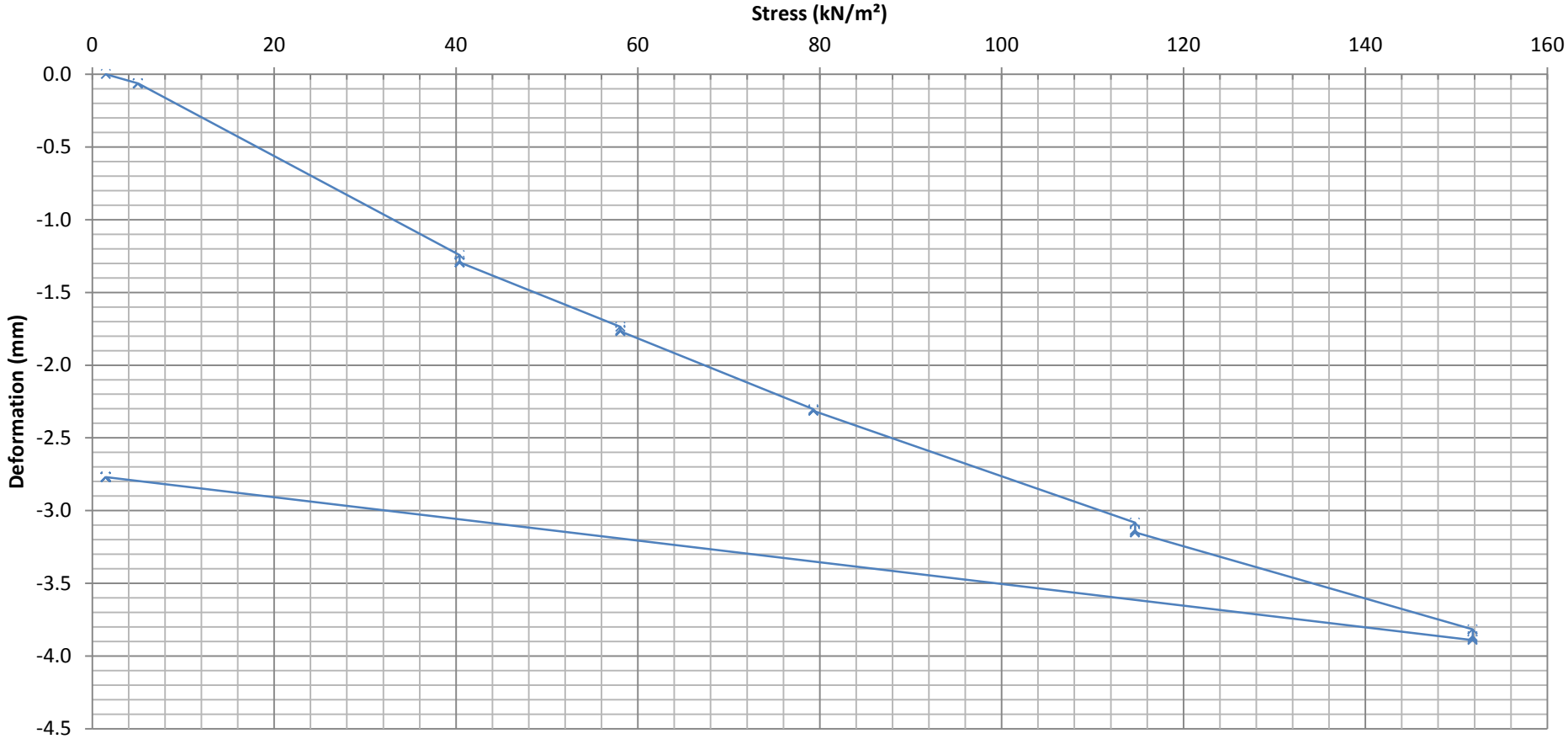
Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Time vs Average Deformation



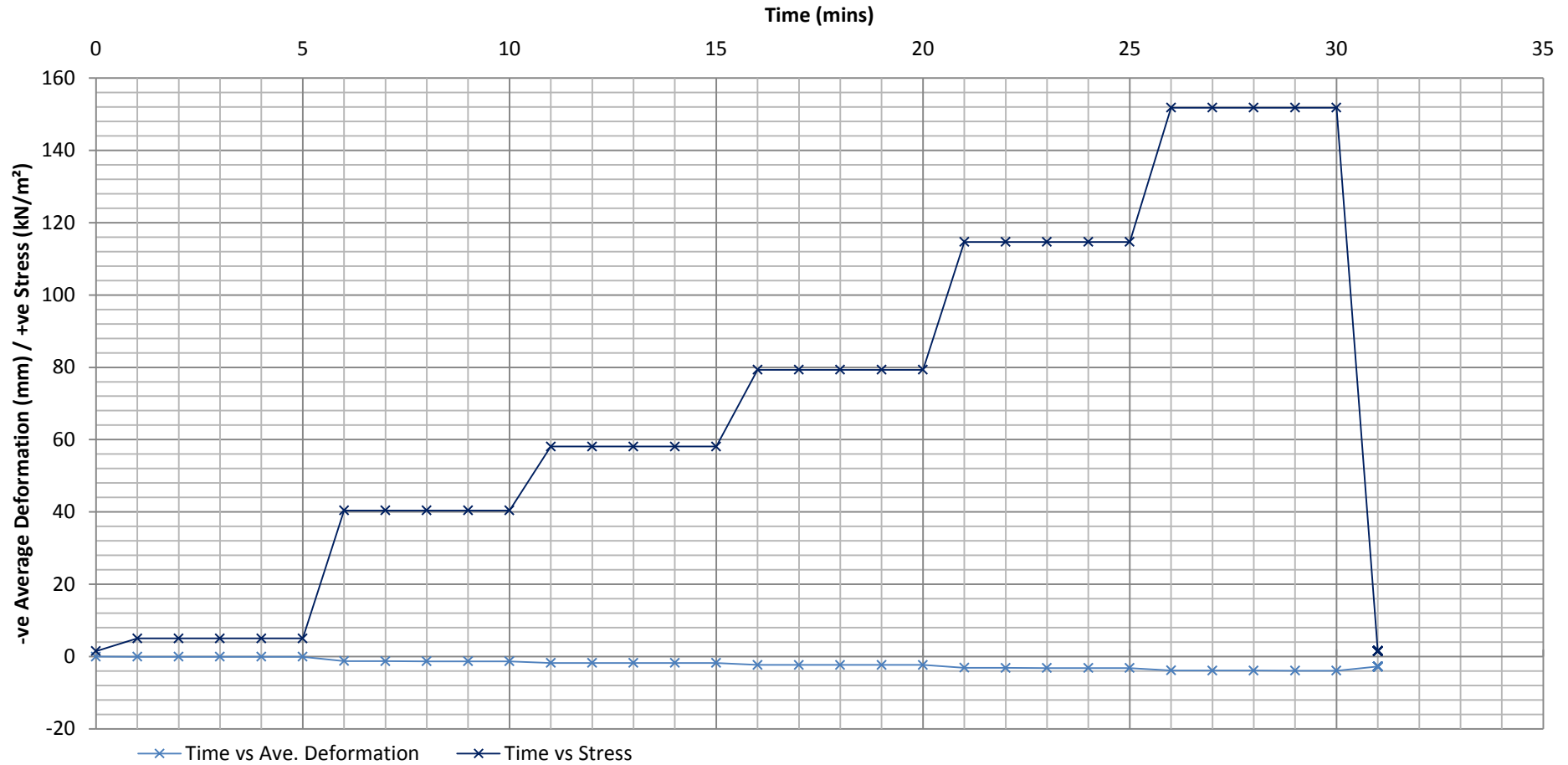
Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Stress vs Average Deformation



Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Time vs Stress/Deformation



Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

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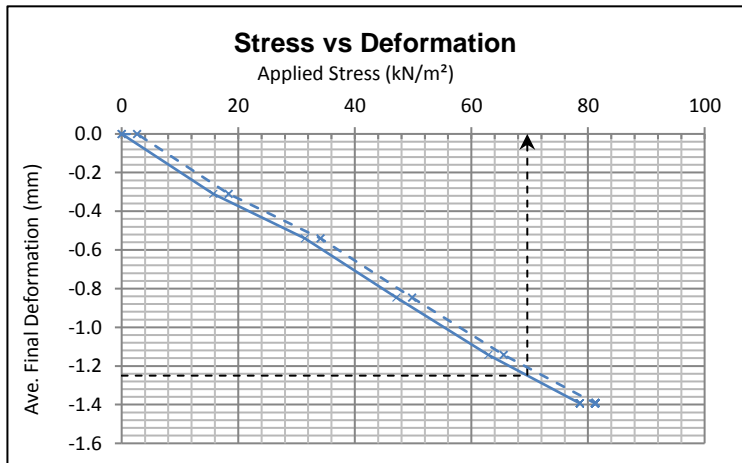
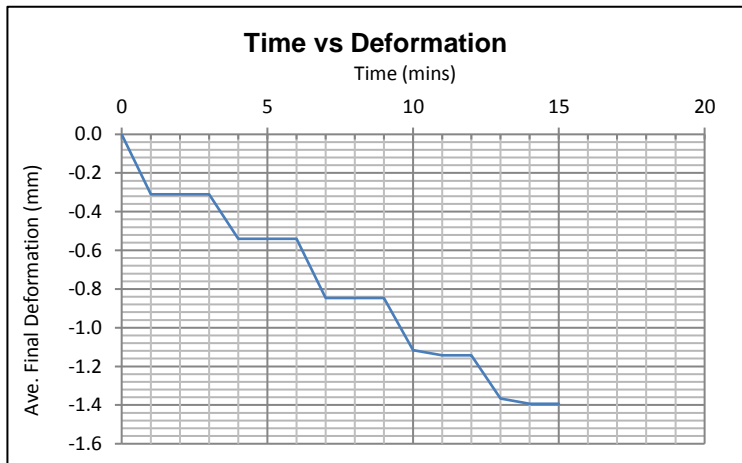
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 25/10/2019	Test Identification: PL 2 (CBR)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	22T Tracked Excavator			
Test Depth	4th visit	m	Material under test	Compacted sandstone aggregate
Description of reaction			Moisture Content of material	- %
Plate Diameter	450	mm	In-situ density of material	- kN/m ³
Plate Area	0.159	m ²	Groundwater level	- m
Mass of test apparatus	43	kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform				m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.31
5	5.42	34.09	-0.54
7.5	7.92	49.81	-0.85
10	10.42	65.53	-1.14
12.5	12.92	81.25	-1.39



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	70 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	35 MN/m ² /m
Equivalent CBR by Plate Loading :	5 %
Moisture Content :	- %

Remarks:

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Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 25/10/2019	Test Identification: PL 2 (Maintained)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	22T Tracked Excavator	Design Working Stress	75 kN/m ²
Test Depth	4th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	600 mm	In-situ density of material	- kN/m ³
Plate Area	0.283 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
0	0	1.49	1.99	0.00	0.00	0.00		0.00
1	1	5.03	6.70	0.00	0.41	0.11		-0.17
1	2	5.03	6.70	0.00	0.41	0.11		-0.17
1	3	5.03	6.70	0.00	0.41	0.11		-0.17
1	4	5.03	6.70	0.00	0.41	0.11		-0.17
1	5	5.03	6.70	0.00	0.41	0.11		-0.17
11	6	40.40	53.86	0.52	1.98	1.28		-1.26
11	7	40.40	53.86	0.52	1.99	1.28		-1.26
11	8	40.40	53.86	0.52	1.99	1.28		-1.26
11	9	40.40	53.86	0.52	1.99	1.28		-1.26
11	10	40.40	53.86	0.52	1.99	1.28		-1.26
16	11	58.08	77.44	0.71	2.54	1.69		-1.65
16	12	58.08	77.44	0.72	2.54	1.69		-1.65
16	13	58.08	77.44	0.72	2.54	1.69		-1.65
16	14	58.08	77.44	0.72	2.54	1.69		-1.65
16	15	58.08	77.44	0.72	2.54	1.69		-1.65
22	16	79.30	105.73	1.00	3.31	2.09		-2.13
22	17	79.30	105.73	1.01	3.32	2.10		-2.14
22	18	79.30	105.73	1.02	3.33	2.10		-2.15
22	19	79.30	105.73	1.04	3.35	2.11		-2.17
22	20	79.30	105.73	1.04	3.35	2.11		-2.17
32	21	114.67	152.89	1.39	4.29	2.60		-2.76
32	22	114.67	152.89	1.40	4.30	2.61		-2.77
32	23	114.67	152.89	1.40	4.31	2.62		-2.78
32	24	114.67	152.89	1.40	4.31	2.62		-2.78
32	25	114.67	152.89	1.40	4.31	2.62		-2.78
42.5	26	151.80	202.41	1.64	4.96	2.94		-3.18

Remarks: Dryer material than previous visits due to less fines.

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Job No:

J4785/19/E

Sheet:

2

Site:

Briestfield Road

Client:

Abode Builders

Test Date:

25/10/2019

Test Identification:

PL 2 (Maintained)

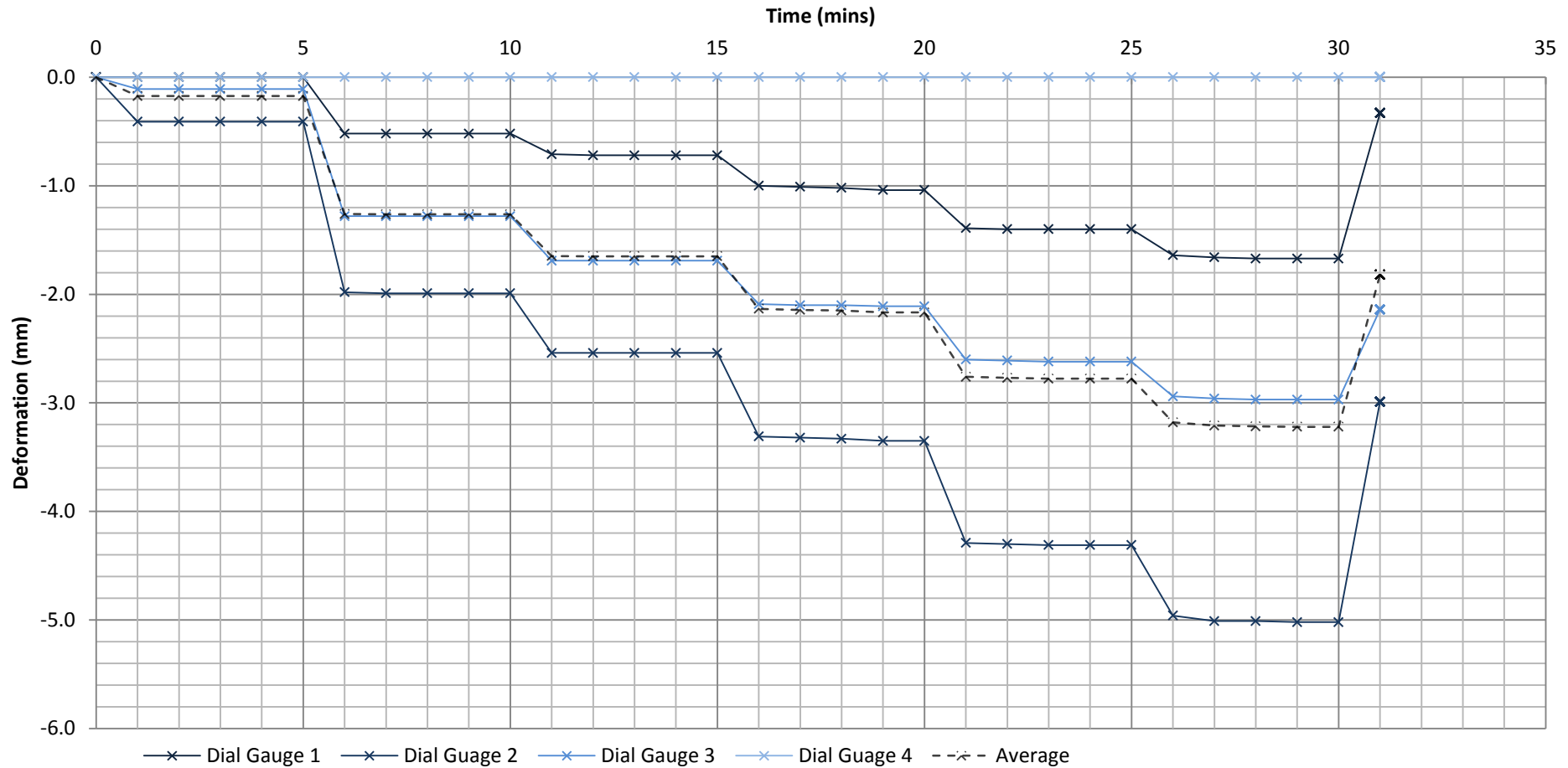
Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
42.5	27	151.80	202.41	1.66	5.01	2.96		-3.21
42.5	28	151.80	202.41	1.67	5.01	2.97		-3.22
42.5	29	151.80	202.41	1.67	5.02	2.97		-3.22
42.5	30	151.80	202.41	1.67	5.02	2.97		-3.22
0	31	1.49	1.99	0.33	2.99	2.14		-1.82

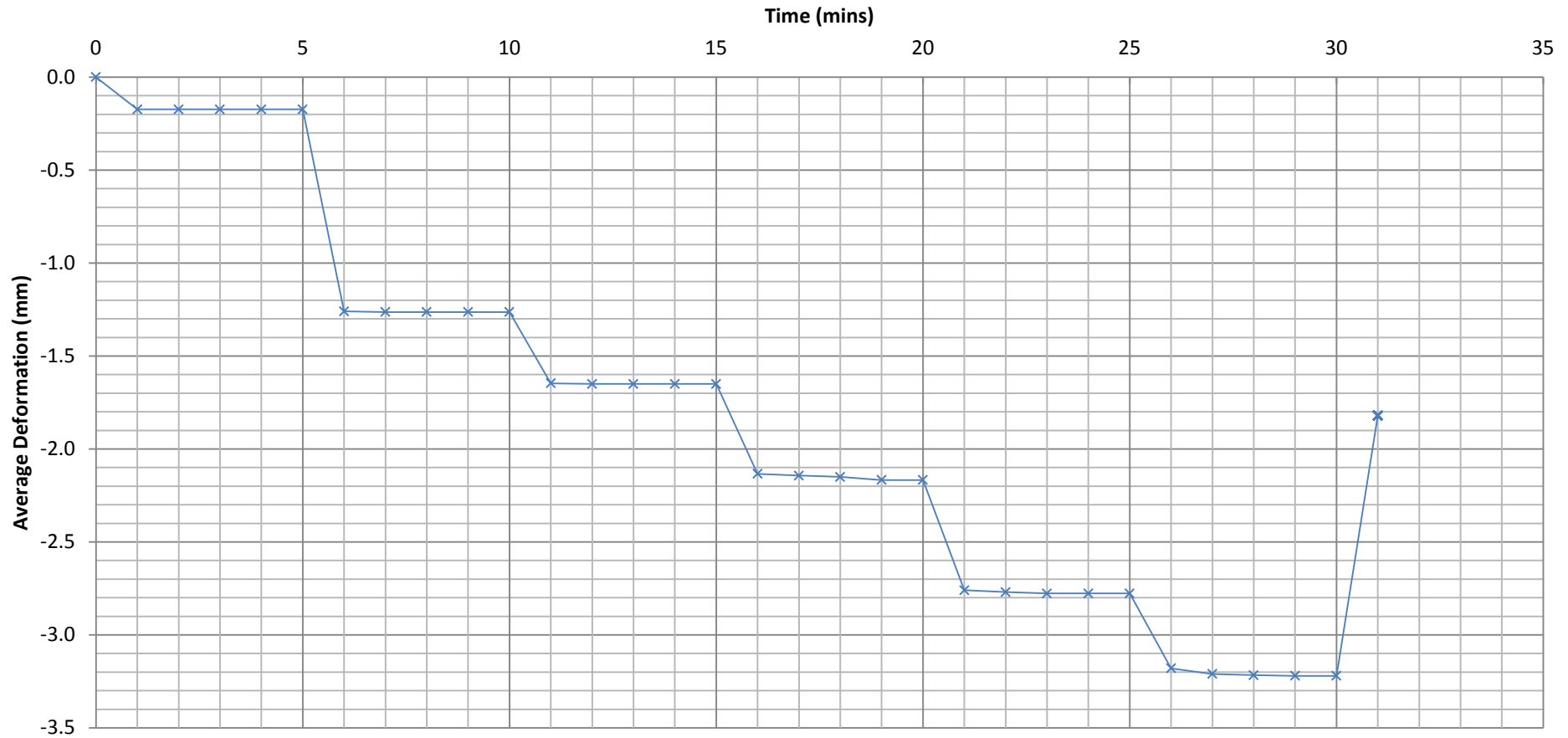
Remarks: Dryer material than previous visits due to less fines.

Time vs Deformation



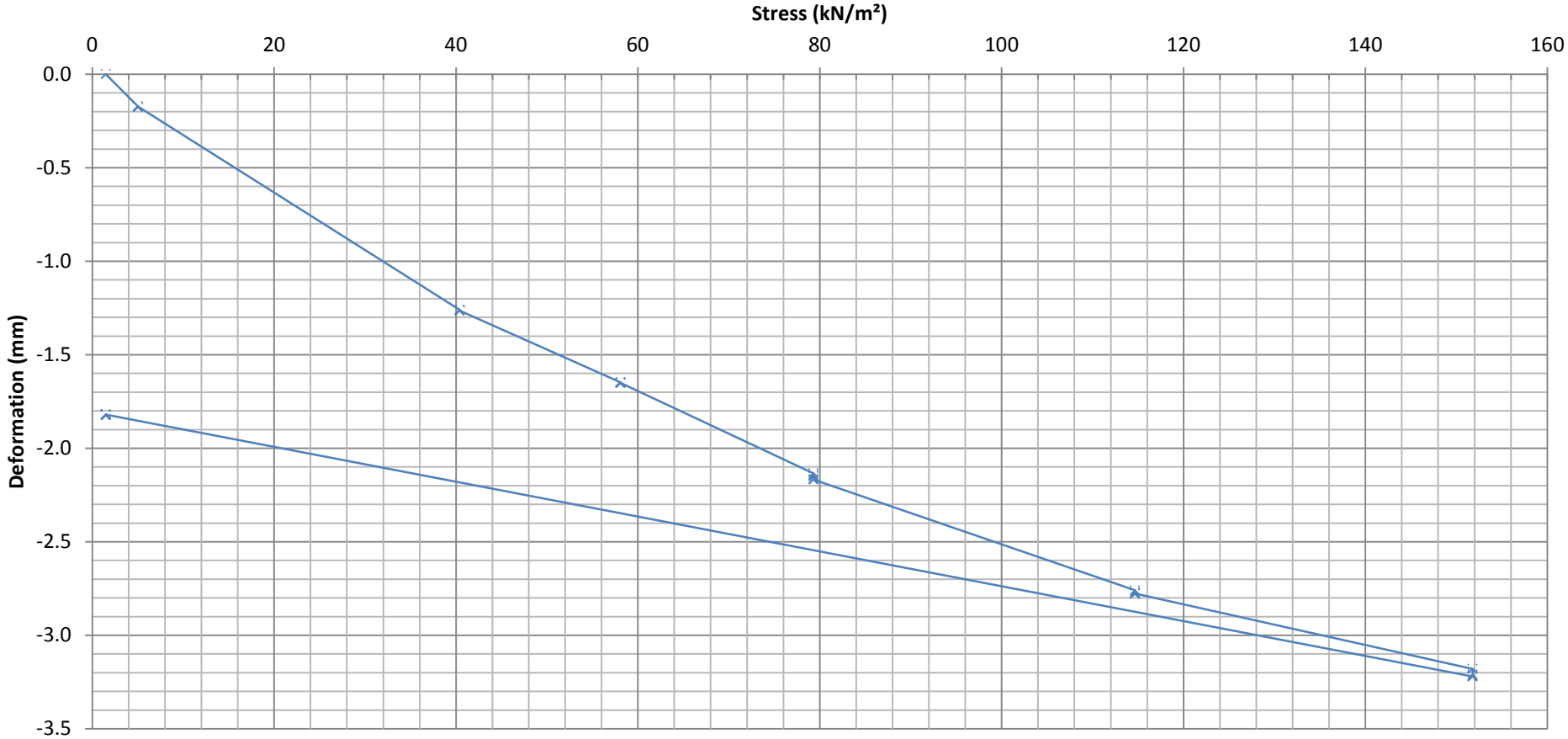
Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Time vs Average Deformation



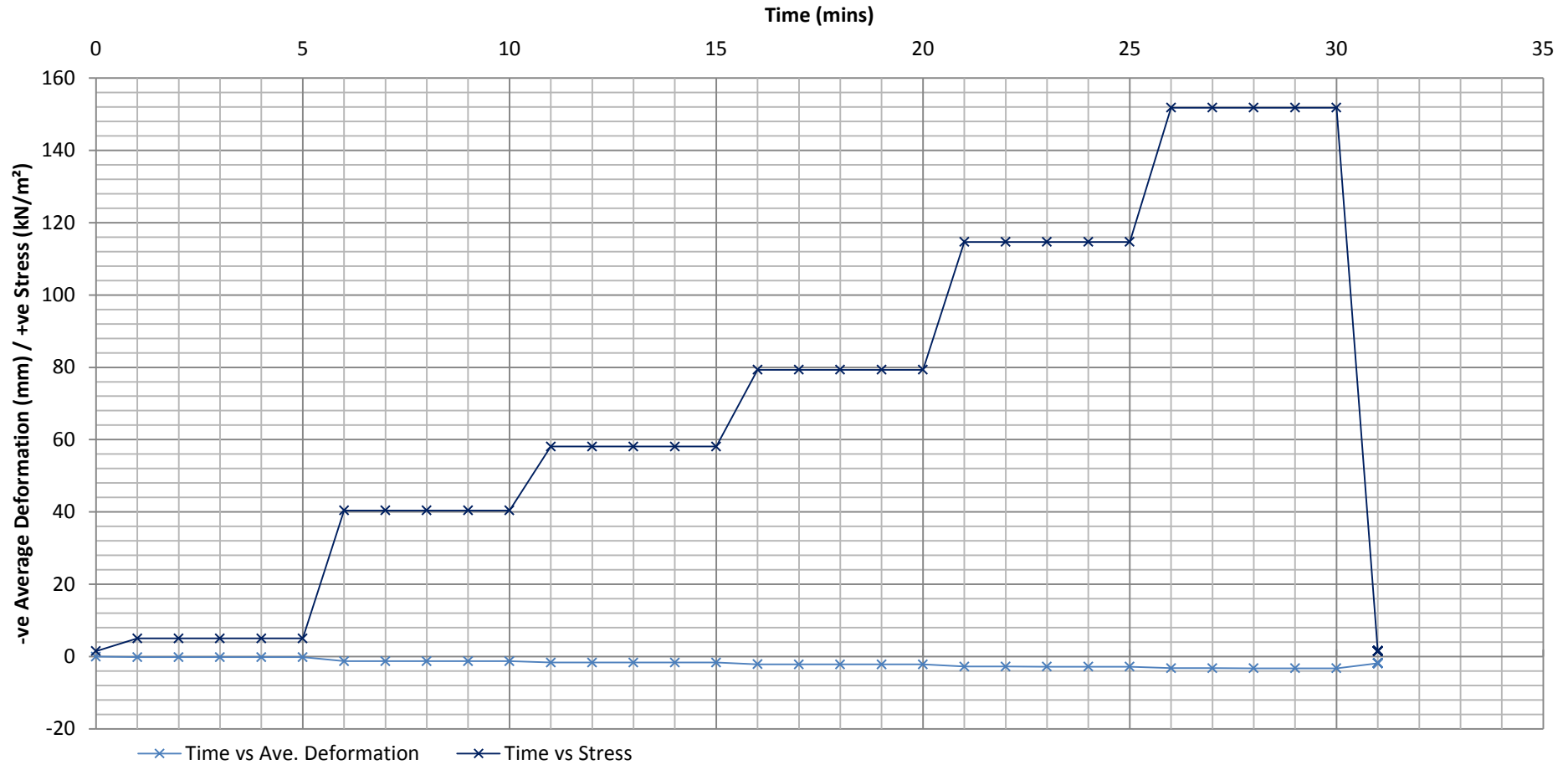
Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Stress vs Average Deformation



Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

Time vs Stress/Deformation



Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:	Dryer material than previous visits due to less fines.
Site	Briestfield Road	Test Date	25/10/2019		
Client	Abode Builders				

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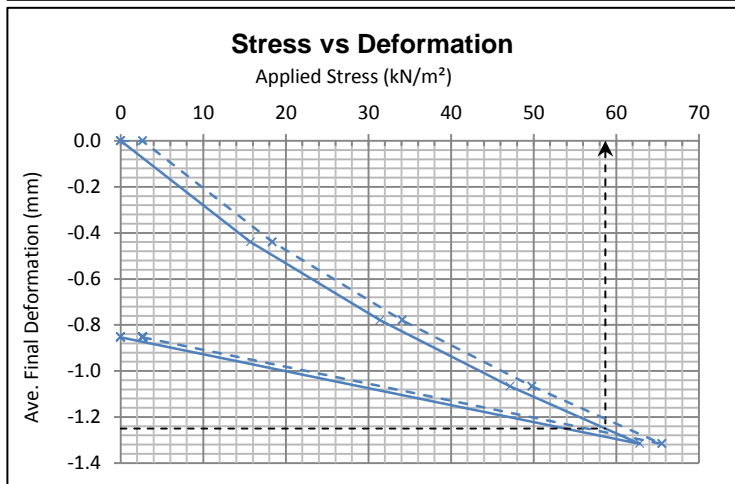
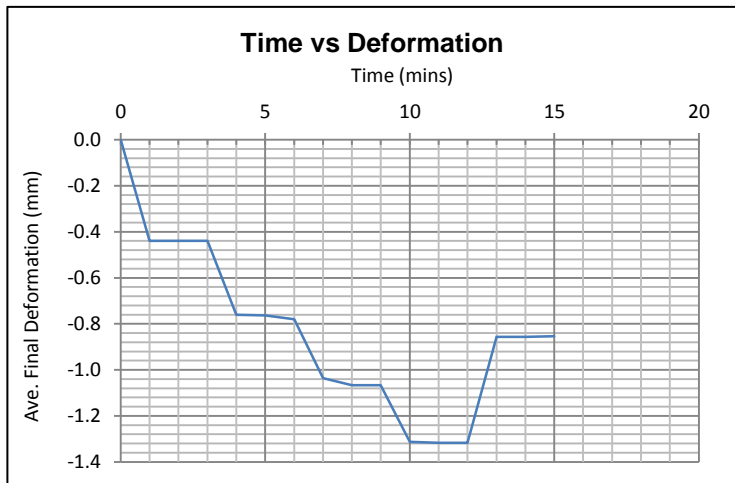
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 05/11/2019	Test Identification: PL 1 (CBR)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator		
Test Depth	5th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell (kN)	Applied Load (kN)	Applied Stress (kN/m ²)	Average Final Deformation (mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.44
5	5.42	34.09	-0.78
7.5	7.92	49.81	-1.07
10	10.42	65.53	-1.32
0	0.42	2.65	-0.85



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	59 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	29 MN/m ² /m
Equivalent CBR by Plate Loading :	3 %
Moisture Content :	- %

Remarks:

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Job No:

J4785/19/E

Sheet:

1

Site:

Briestfield Road

Client:

Abode Builders

Test Date:

05/11/2019

Test Identification:

PL 1 (Maintained)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

BS. 1377 : PART 9 : 1990 : 4.1 - Incremental loading test

Test subject	18.3T Tracked Excavator	Design Working Stress	75 kN/m ²
Test Depth	5th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	600 mm	In-situ density of material	- kN/m ³
Plate Area	0.283 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
0	0	1.49	1.99	0.00	0.00	0.00		0.00
1	1	5.03	6.70	0.67	0.44	0.88		-0.66
1	2	5.03	6.70	0.67	0.44	0.88		-0.66
1	3	5.03	6.70	0.67	0.44	0.88		-0.66
1	4	5.03	6.70	0.67	0.44	0.88		-0.66
1	5	5.03	6.70	0.67	0.44	0.88		-0.66
10	6	36.86	49.15	2.17	2.36	1.85		-2.13
10	7	36.86	49.15	2.17	2.36	1.85		-2.13
10	8	36.86	49.15	2.17	2.36	1.86		-2.13
10	9	36.86	49.15	2.17	2.36	1.86		-2.13
10	10	36.86	49.15	2.17	2.36	1.86		-2.13
16	11	58.08	77.44	2.60	3.04	2.37		-2.67
16	12	58.08	77.44	2.60	3.04	2.34		-2.66
16	13	58.08	77.44	2.60	3.05	2.36		-2.67
16	14	58.08	77.44	2.62	3.07	2.40		-2.70
16	15	58.08	77.44	2.62	3.07	2.40		-2.70
22.5	16	81.07	108.09	3.02	3.65	2.79		-3.15
22.5	17	81.07	108.09	3.04	3.64	2.81		-3.16
22.5	18	81.07	108.09	3.05	3.70	2.81		-3.19
22.5	19	81.07	108.09	3.05	3.70	2.81		-3.19
22.5	20	81.07	108.09	3.05	3.70	2.81		-3.19
47.5	22	169.49	225.99	4.30	4.13	3.71		-4.05
47.5	23	169.49	225.99	4.30	4.13	3.71		-4.05
47.5	24	169.49	225.99	4.30	4.14	3.71		-4.05
47.5	25	169.49	225.99	4.30	4.14	3.71		-4.05
47.5	26	169.49	225.99	4.30	4.14	3.71		-4.05
0	27	1.49	1.99	3.14	3.92	2.85		-3.30

Remarks:

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Job No:

J4785/19/E

Sheet:

2

Site:

Briestfield Road

Client:

Abode Builders

Test Date:

05/11/2019

Test Identification:

PL 1 (Maintained)

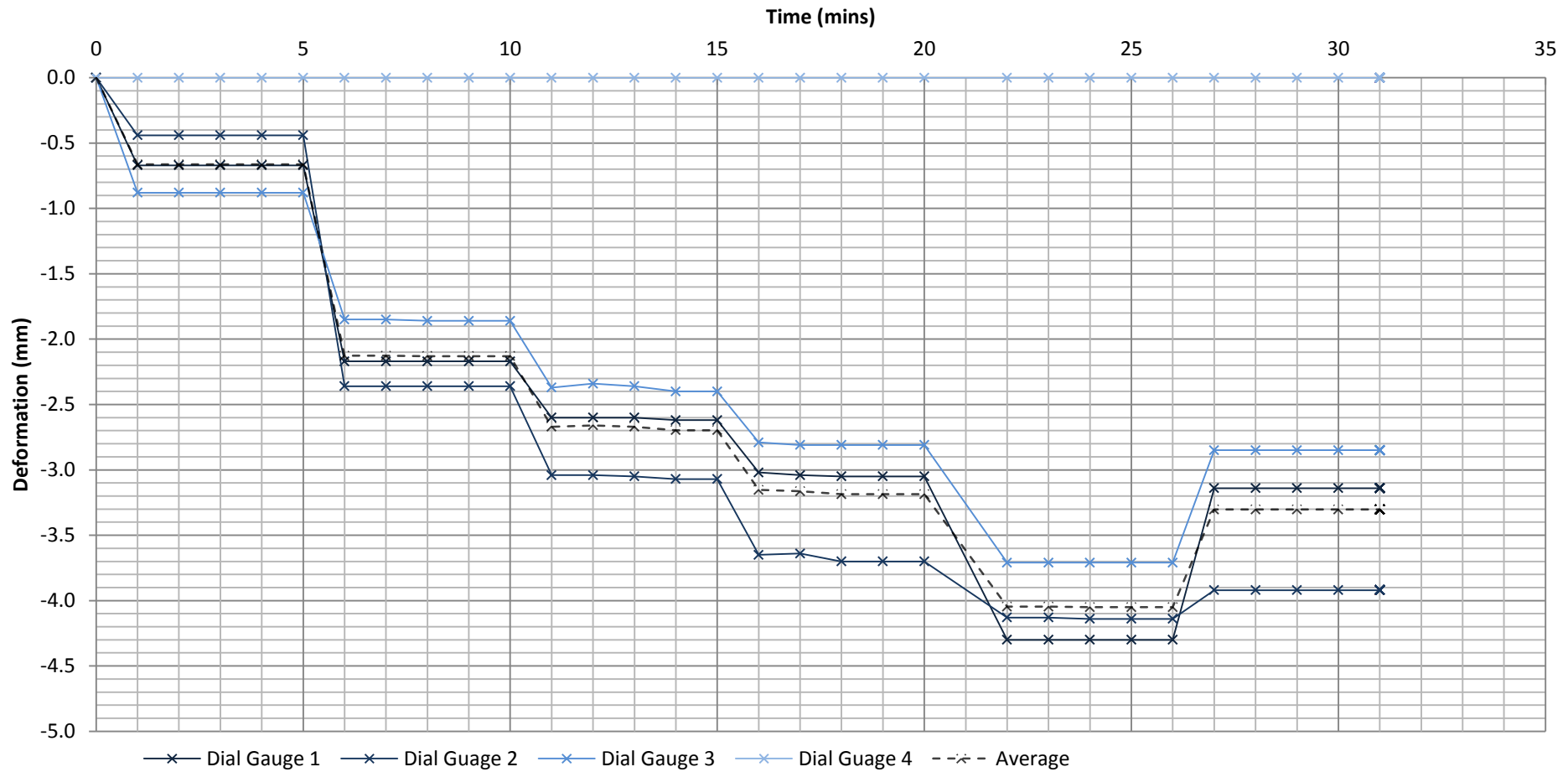
Determination of the vertical deformation and strength characteristics of soil by the plate loading test

BS. 1377 : PART 9 : 1990 : 4.1 - Incremental loading test

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
0	28	1.49	1.99	3.14	3.92	2.85		-3.30
0	29	1.49	1.99	3.14	3.92	2.85		-3.30
0	30	1.49	1.99	3.14	3.92	2.85		-3.30
0	31	1.49	1.99	3.14	3.92	2.85		-3.30

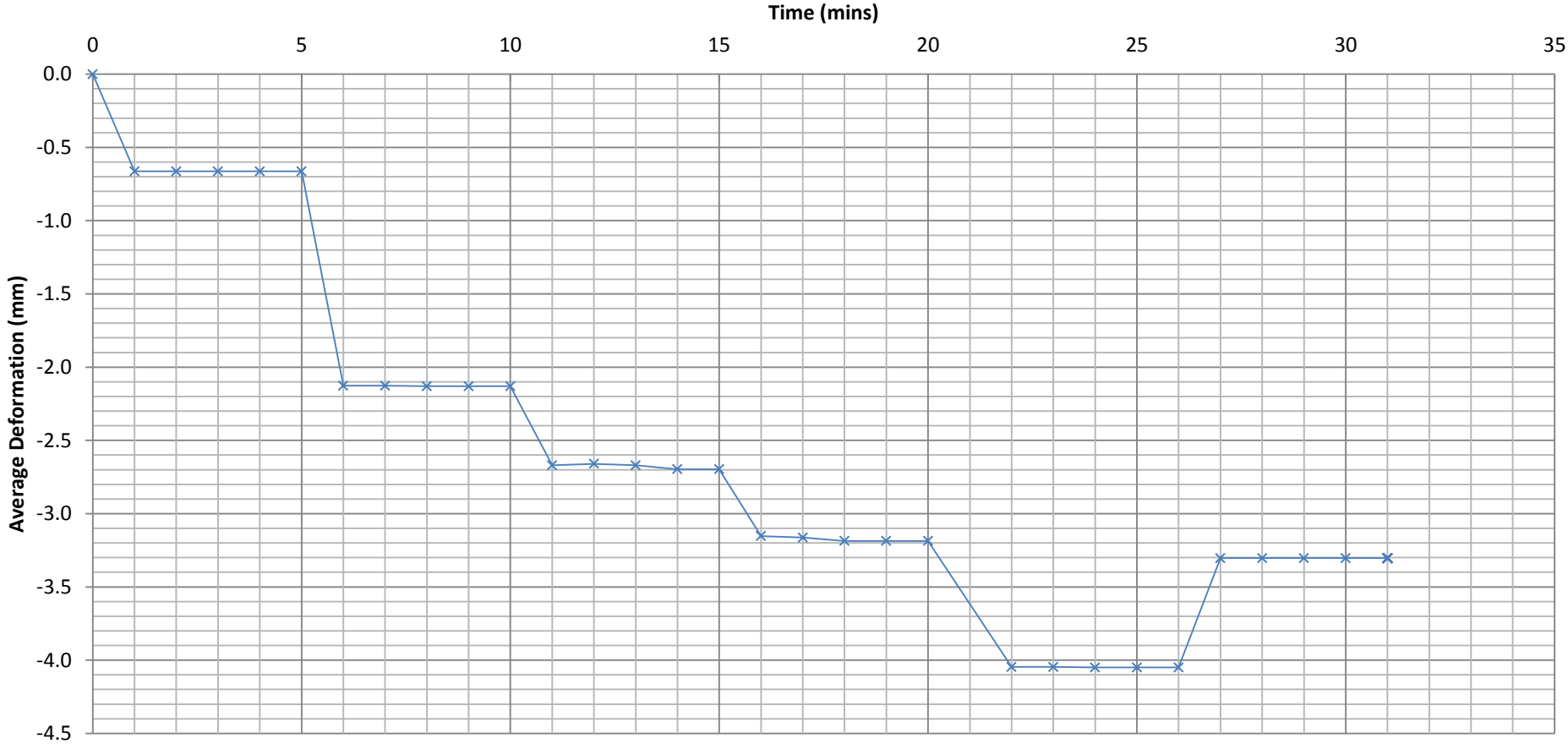
Remarks:

Time vs Deformation



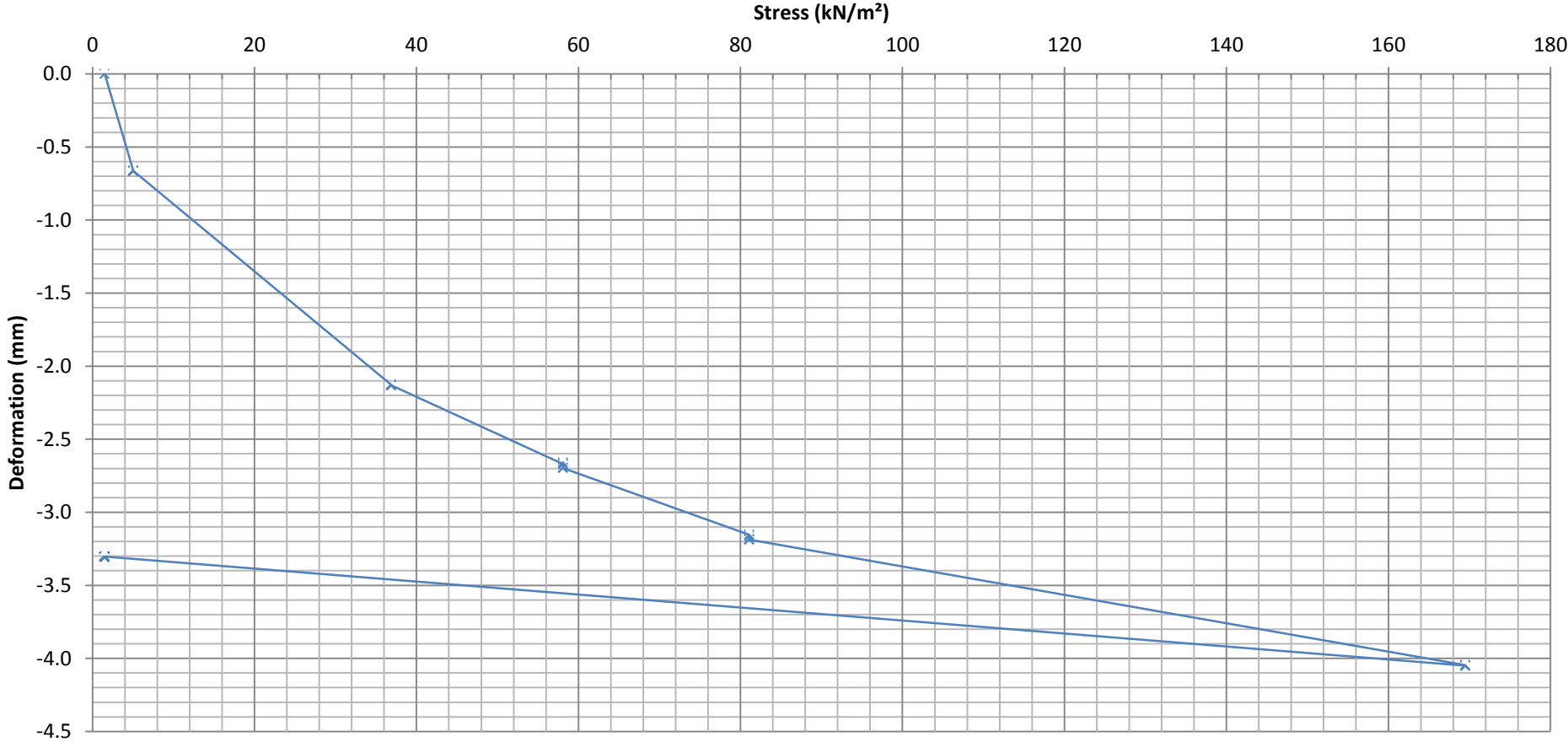
Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Time vs Average Deformation



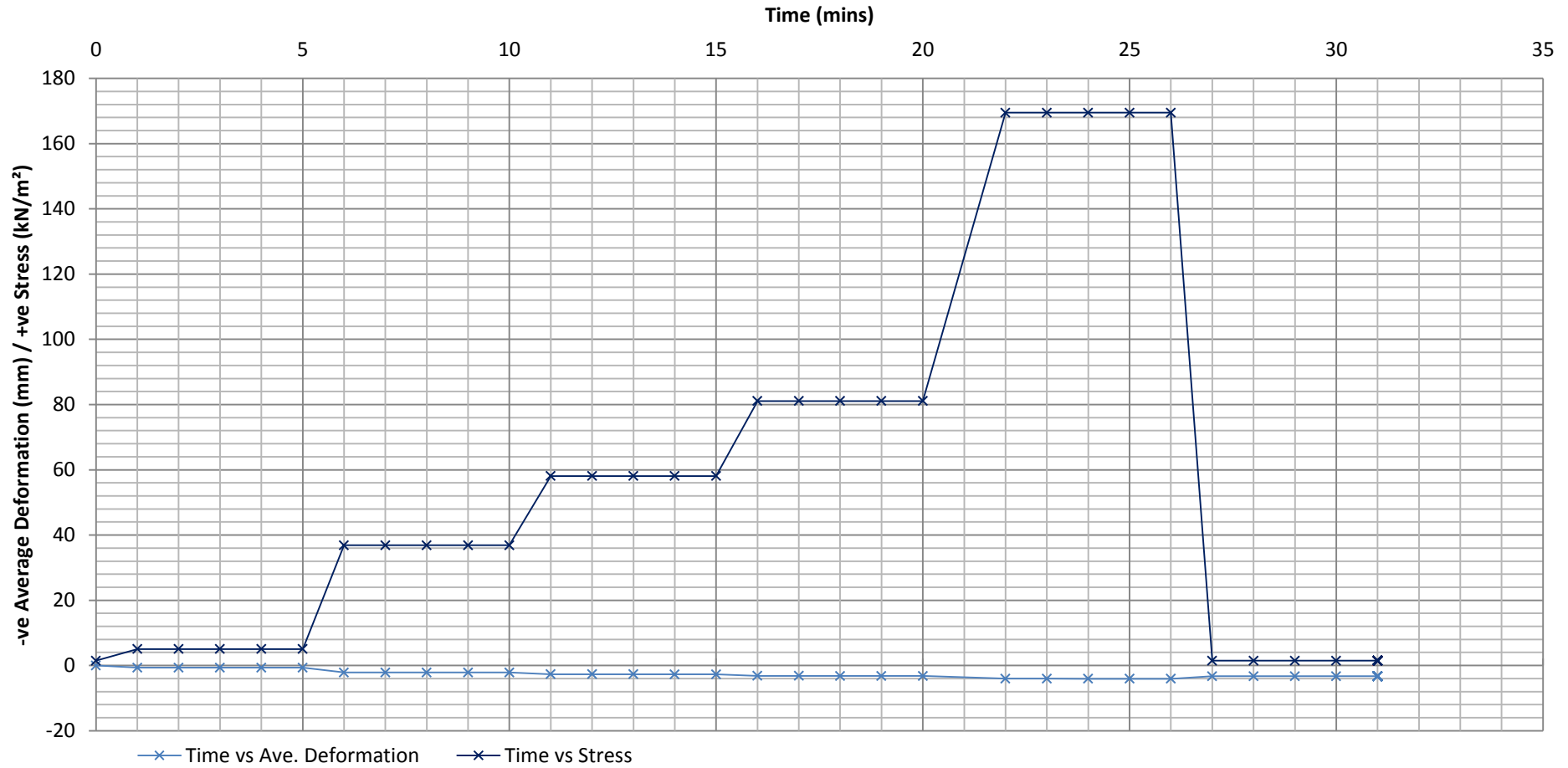
Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Stress vs Average Deformation



Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Time vs Stress/Deformation



Job No.	J4785/19/E	Test Identification	PL 1 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

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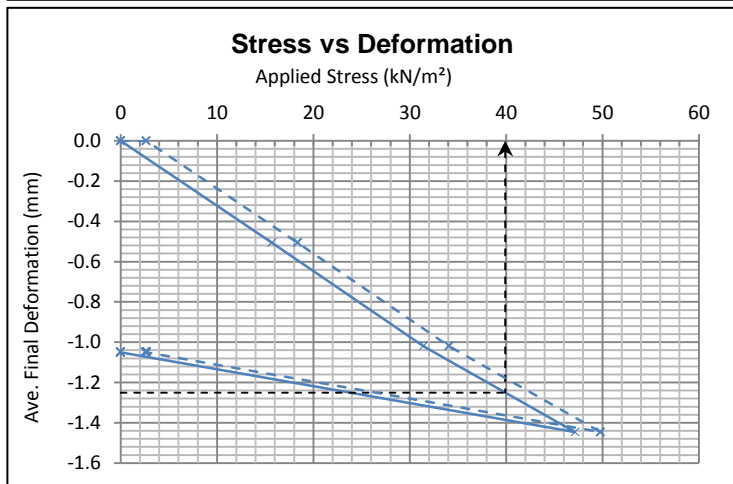
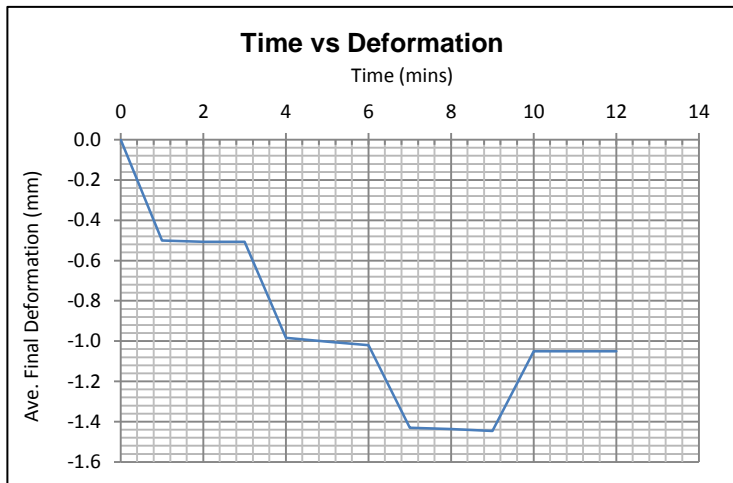
Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 05/11/2019	Test Identification: PL 2 (CBR)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

In-house procedure based on BS. 1377 : PART 9 : 1990 : 4.1 & IAN73/06

Test subject	18.3T Tracked Excavator		
Test Depth	5th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	450 mm	In-situ density of material	- kN/m ³
Plate Area	0.159 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Applied Load	Applied Stress	Average Final Deformation
(kN)	(kN)	(kN/m ²)	(mm)
0	0.42	2.65	0.00
2.5	2.92	18.37	-0.51
5	5.42	34.09	-1.02
7.5	7.92	49.81	-1.45
0	0.42	2.65	-1.05



Original data shown as dashed line. Solid line shows adjusted applied stress which has been considered due to initial unrepresentative movements. Derived CBR value based on applied stress that has been adjusted by 2.65kN/m²

Conversion Factor to a 762mm dia. plate :	0.62
Applied Stress at 1.25 mm Deformation:	40 kN/m ²
Modulus of Subgrade Reaction (k ₇₆₂):	20 MN/m ² /m
Equivalent CBR by Plate Loading :	2 %
Moisture Content :	- %

Remarks:

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Job No: J4785/19/E	Sheet: 1
Site: Briestfield Road	Client: Abode Builders
Test Date: 05/11/2019	Test Identification: PL 2 (Maintained)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test

BS. 1377 : PART 9 : 1990 : 4.1 - Incremental loading test

Test subject	18.3T Tracked Excavator	Design Working Stress	75 kN/m ²
Test Depth	5th visit m	Material under test	Compacted sandstone aggregate
Description of reaction		Moisture Content of material	- %
Plate Diameter	600 mm	In-situ density of material	- kN/m ³
Plate Area	0.283 m ²	Groundwater level	- m
Mass of test apparatus	43 kg	Weather Conditions	Overcast
Distance between the edge of the loaded plate and the edge of excavation or platform			m

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
0	0	1.49	1.99	0.00	0.00	0.00		0.00
1	1	5.03	6.70	0.10	0.20	0.20		-0.17
1	2	5.03	6.70	0.10	0.20	0.20		-0.17
1	3	5.03	6.70	0.10	0.20	0.20		-0.17
1	4	5.03	6.70	0.10	0.20	0.20		-0.17
11	5	40.40	53.86	0.10	0.20	0.20		-0.17
11	6	40.40	53.86	1.15	1.17	1.44		-1.25
11	7	40.40	53.86	1.16	1.18	1.45		-1.26
11	8	40.40	53.86	1.16	1.19	1.45		-1.27
11	9	40.40	53.86	1.16	1.19	1.45		-1.27
11	10	40.40	53.86	1.16	1.19	1.45		-1.27
16	11	58.08	77.44	1.55	1.54	1.78		-1.62
16	12	58.08	77.44	1.56	1.55	1.78		-1.63
16	13	58.08	77.44	1.57	1.57	1.80		-1.65
16	14	58.08	77.44	1.58	1.58	1.80		-1.65
16	15	58.08	77.44	1.58	1.58	1.80		-1.65
22.5	16	81.07	108.09	2.17	2.12	2.28		-2.19
22.5	17	81.07	108.09	2.19	2.13	2.30		-2.21
22.5	18	81.07	108.09	2.20	2.15	2.30		-2.22
22.5	19	81.07	108.09	2.20	2.15	2.30		-2.22
22.5	20	81.07	108.09	2.20	2.15	2.30		-2.22
32.5	21	116.44	155.25	2.94	2.90	2.92		-2.92
32.5	22	116.44	155.25	2.98	2.93	2.94		-2.95
32.5	23	116.44	155.25	2.99	2.94	2.94		-2.96
32.5	24	116.44	155.25	2.99	2.95	2.94		-2.96
32.5	25	116.44	155.25	2.99	2.95	2.95		-2.96
42.5	26	151.80	202.41	3.60	3.57	3.47		-3.55

Remarks:

Rogers Geotechnical Services Ltd

Offices 1 & 2, Barncliffe Business Park,
Near Bank, Shelley,
Huddersfield
HD8 8LU
www.rogersgeotech.co.uk

Tel : 0843 50 666 87

Fax : 0843 51 599 30

Job No:

J4785/19/E

Sheet:

2

Site:

Briestfield Road

Client:

Abode Builders

Test Date:

05/11/2019

Test Identification:

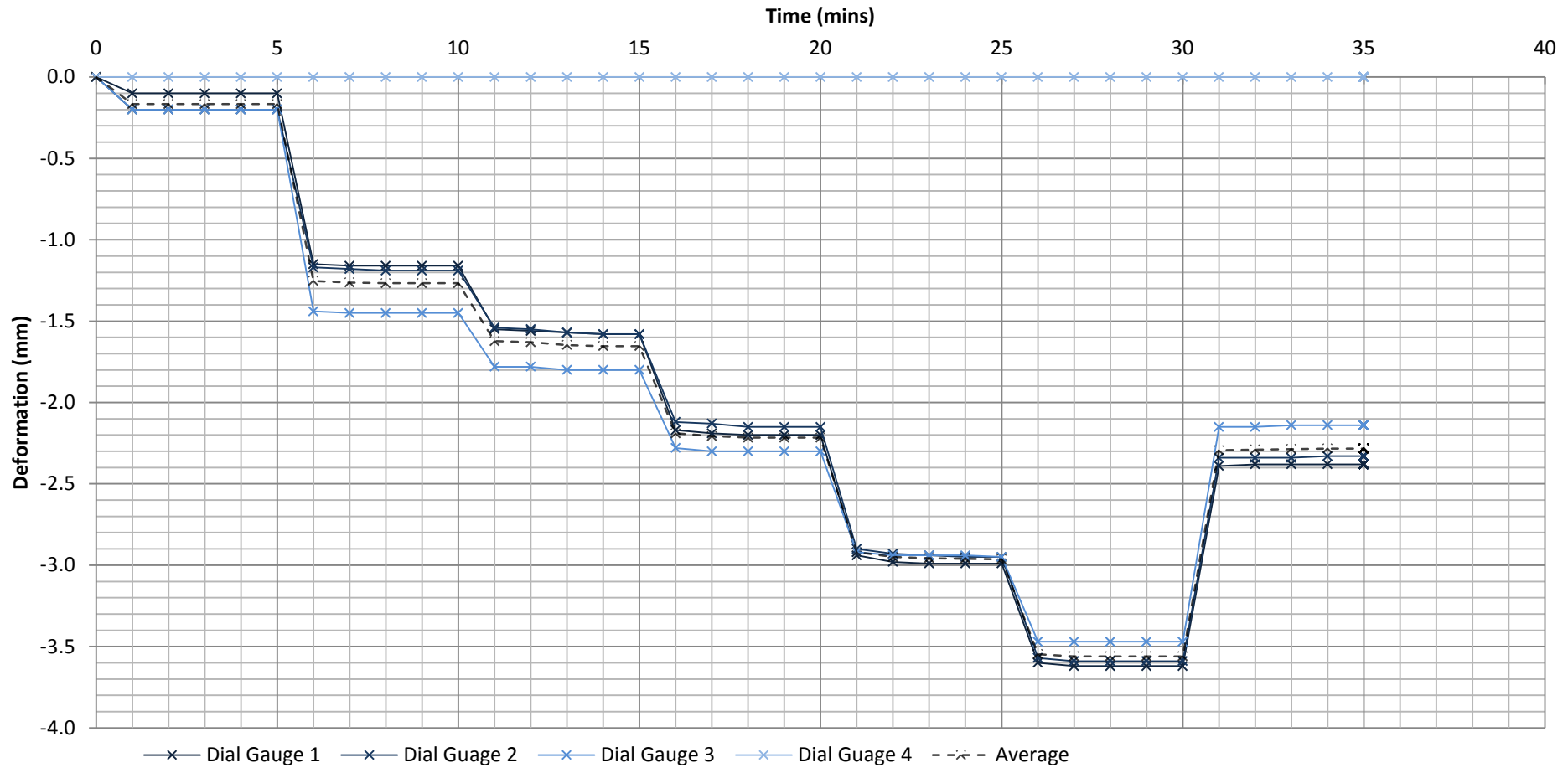
PL 2 (Maintained)

Determination of the vertical deformation and strength characteristics of soil by the plate loading test**BS. 1377 : PART 9 : 1990 : 4.1 - Incremental loading test**

Load Cell	Elapsed Time	Applied Stress		Deformation				Average
				Dial Gauge 1	Dial Gauge 2	Dial Gauge 3	Dial Gauge 4	
(kN)	(minutes)	(kN/m ²)	(% DWS)	(mm)	(mm)	(mm)	(mm)	(mm)
42.5	27	151.80	202.41	3.62	3.59	3.47		-3.56
42.5	28	151.80	202.41	3.62	3.59	3.47		-3.56
42.5	29	151.80	202.41	3.62	3.59	3.47		-3.56
42.5	30	151.80	202.41	3.62	3.59	3.47		-3.56
0	31	1.49	1.99	2.39	2.34	2.15		-2.29
0	32	1.49	1.99	2.38	2.34	2.15		-2.29
0	33	1.49	1.99	2.38	2.34	2.14		-2.29
0	34	1.49	1.99	2.38	2.33	2.14		-2.28
0	35	1.49	1.99	2.38	2.33	2.14		-2.28

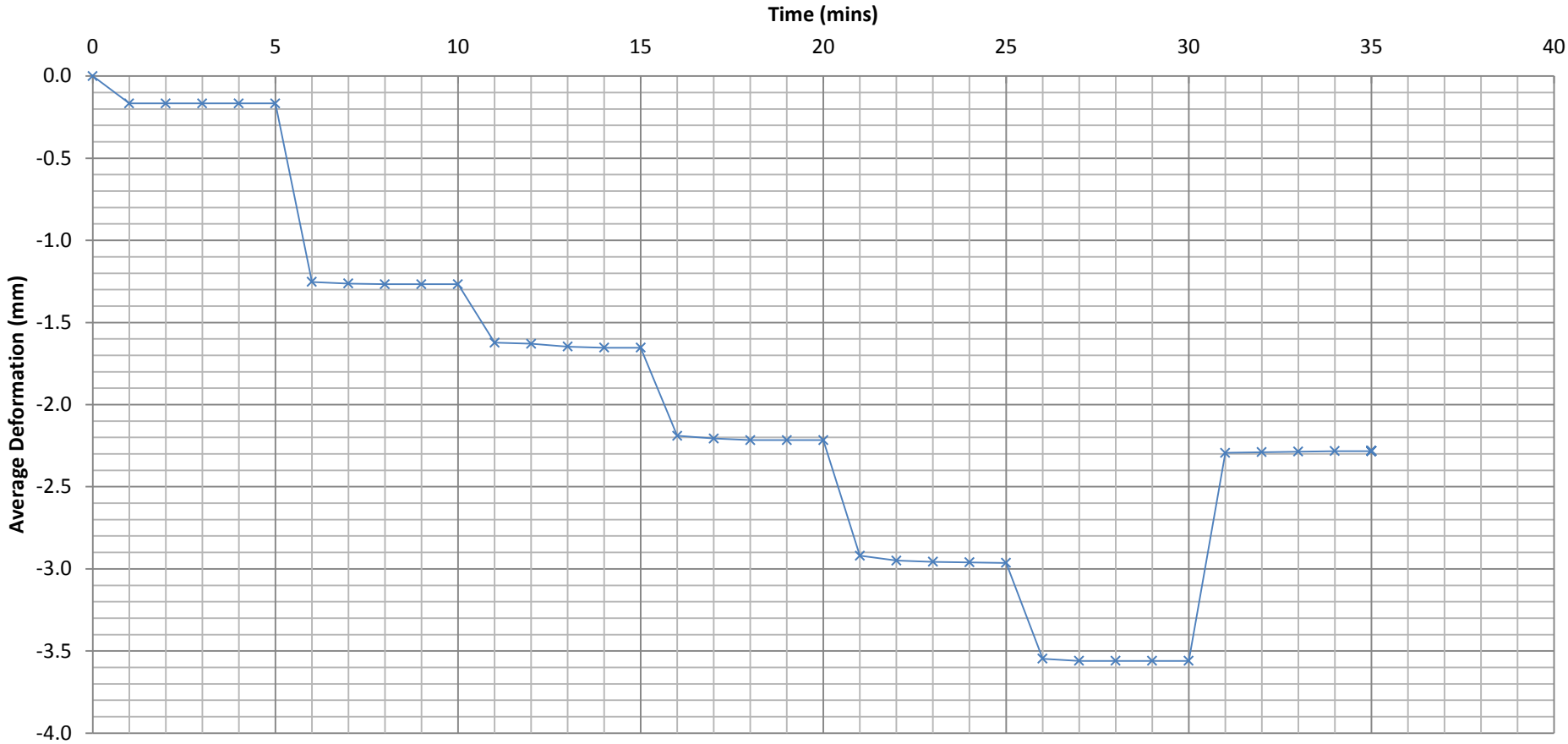
Remarks:

Time vs Deformation



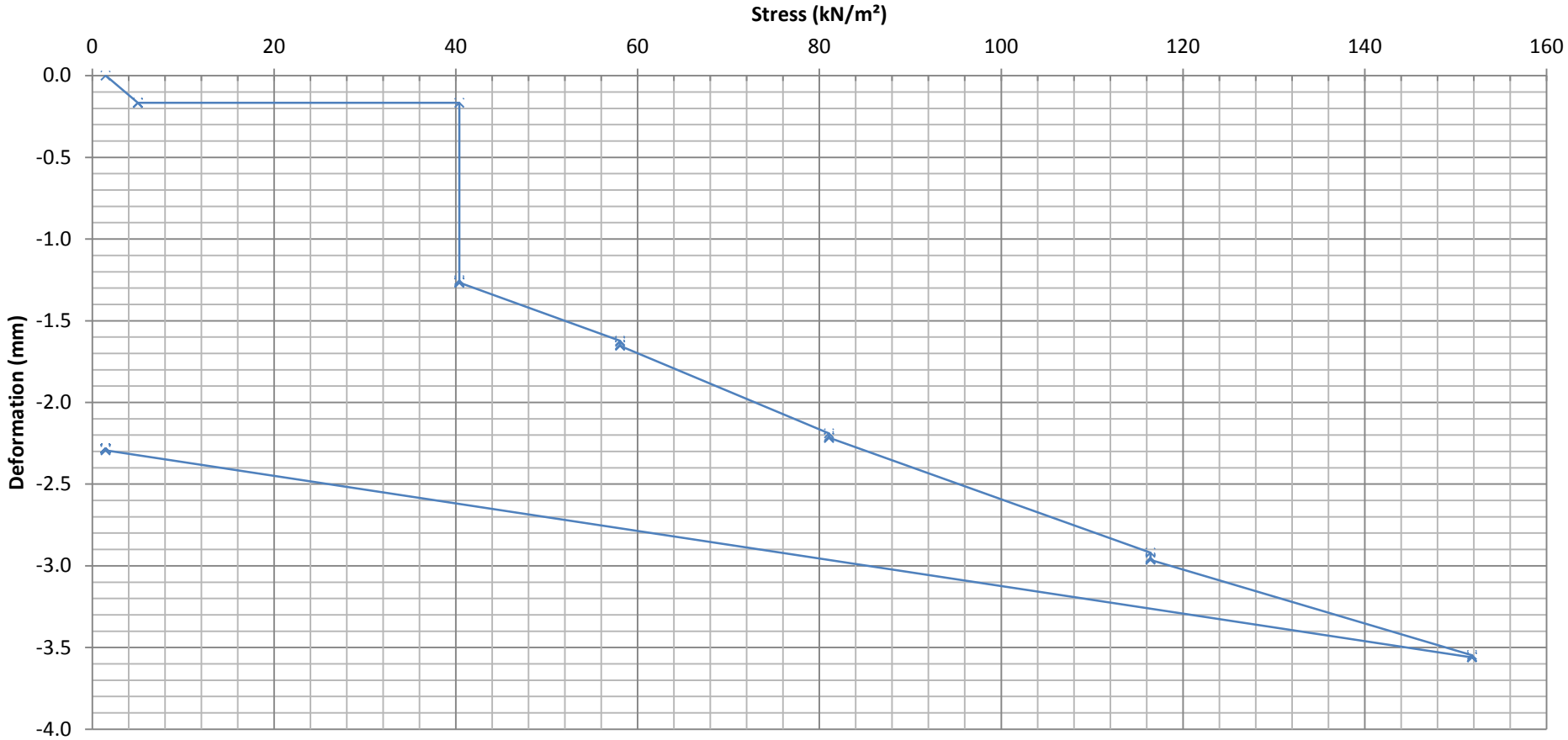
Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Time vs Average Deformation



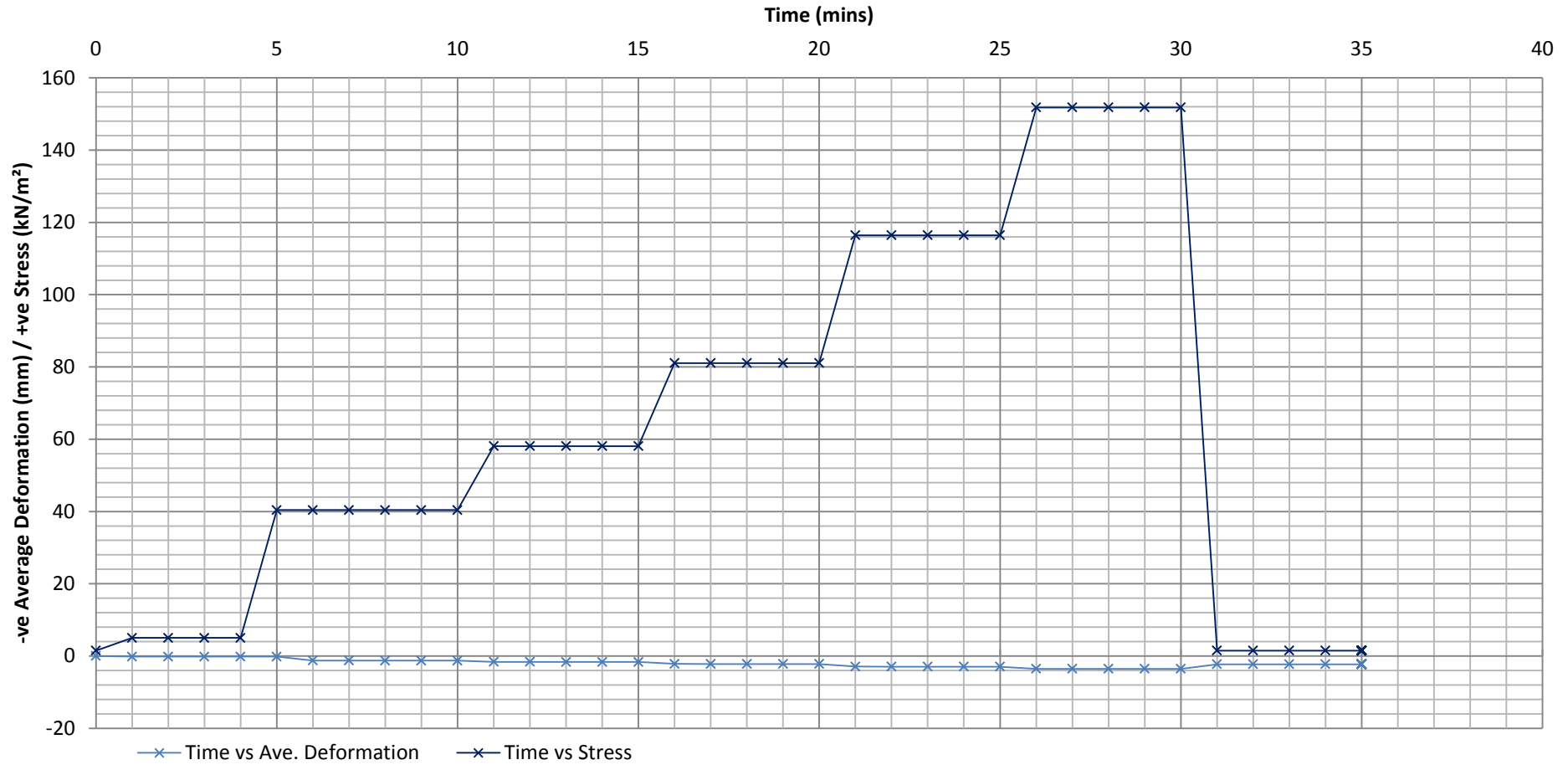
Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Stress vs Average Deformation



Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			

Time vs Stress/Deformation



Job No.	J4785/19/E	Test Identification	PL 2 (Maintained)	Remarks:
Site	Briestfield Road	Test Date	05/11/2019	
Client	Abode Builders			