

McMillan Drilling
Standard Penetration Test (SPT)
Hammer Energy Measurement Certificates

STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: N118-20220209

Standard: ASTM D4633-10

Date: 9/2/2022

Geotechnical hammer

Type: Safety Auto	Maker: Massenza	Mass: 63.5kg	Hammer ID: N118
Anvil dimensions: 55mm OD, 175mm long		Drop height: 760mm	
Notes:			

Instrumented rod

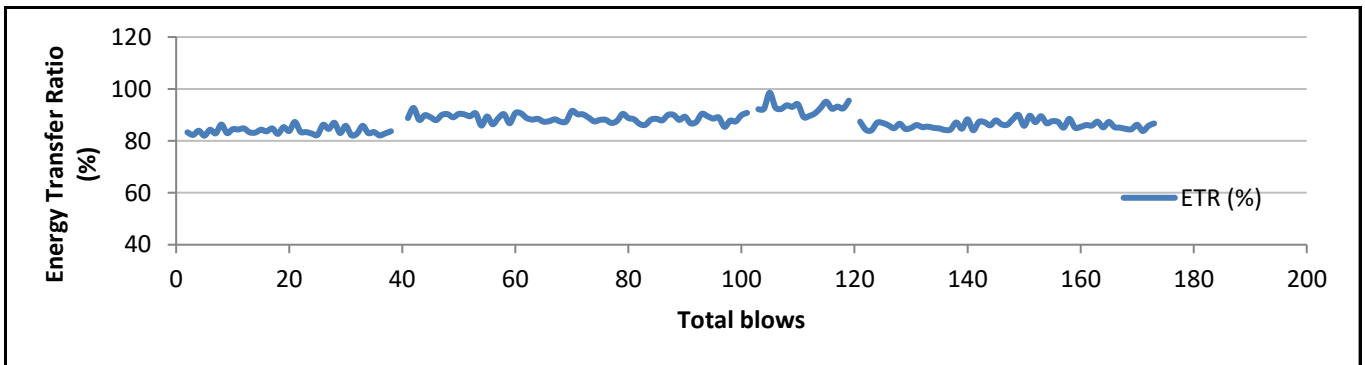
Serial: 591AWJ	Type: AWJ	Maker: Pile Dynamics, Inc.	Area: 7.70cm ²
Outer diameter: 44.5mm	Inner diameter: 15.9mm	Calibration date: 16/1/2021	
Strain sensor F3: 591AWJ-1	Strain sensor F4: 591AWJ-2	Calibration date: 16/1/2021	
Accelerometer A3: K3535	Accelerometer A4: K10904	Calibration date: 27/8/2020	

Processing equipment

Model: PDA, SPT Analyzer	Maker: Pile Dynamics, Inc.	Calibration Date: 13/12/2018
Serial: 4077 TA	Sample size: 8k	Sample frequency: 100kHz

Tests

Job No. - Location	Testing site - Sweetcorn Place, Pukekohe				
Test No.	1	2	3	4	5
Borehole	BH001	BH001	BH001	BH001	
Test date	8/2/2022	8/2/2022	8/2/2022	8/2/2022	
Test time	12:09 PM	12:54 PM	2:44 PM	3:30 PM	
Depth below ground level (LP)	12.00m	14.50m	15.00m	16.50m	
Depth below sensors (LE)	13.40m	15.90m	16.35m	17.85m	
No. blows	37	61	17	53	
Average measured blows per minute	22.1	21.3	27.9	23.2	
Average hammer energy efficiency:	83.9%	88.7%	92.9%	86.2%	

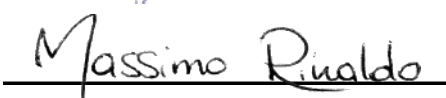


Total blows analysed	168	Average hammer energy efficiency	87.2%
Standard deviation	3.1		

Tested by: Fraser Bainbridge

Signature: 

Checked by: Massimo Rinaldo

Signature: 

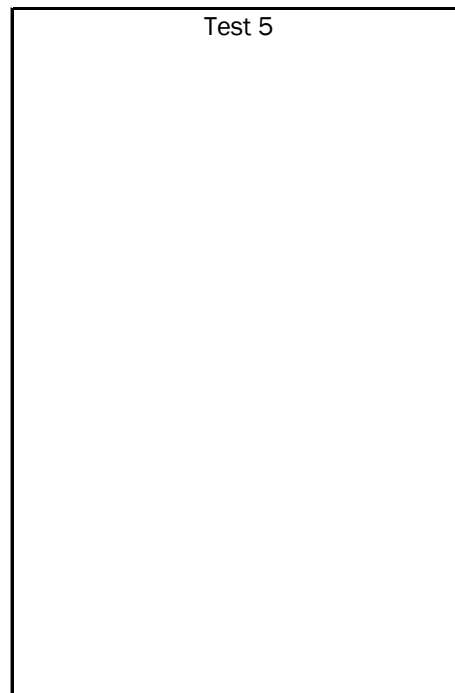
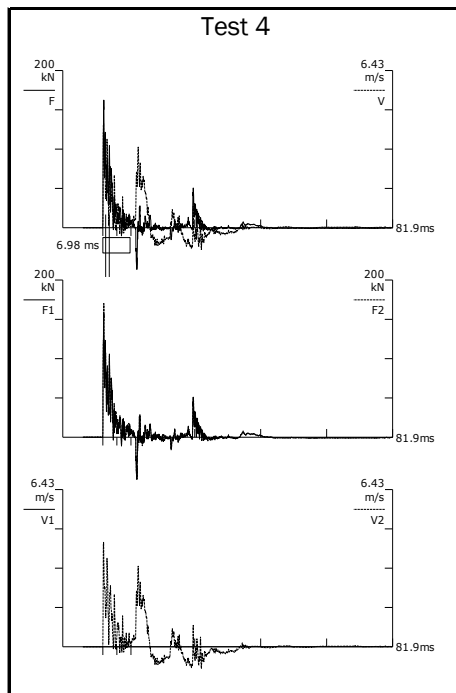
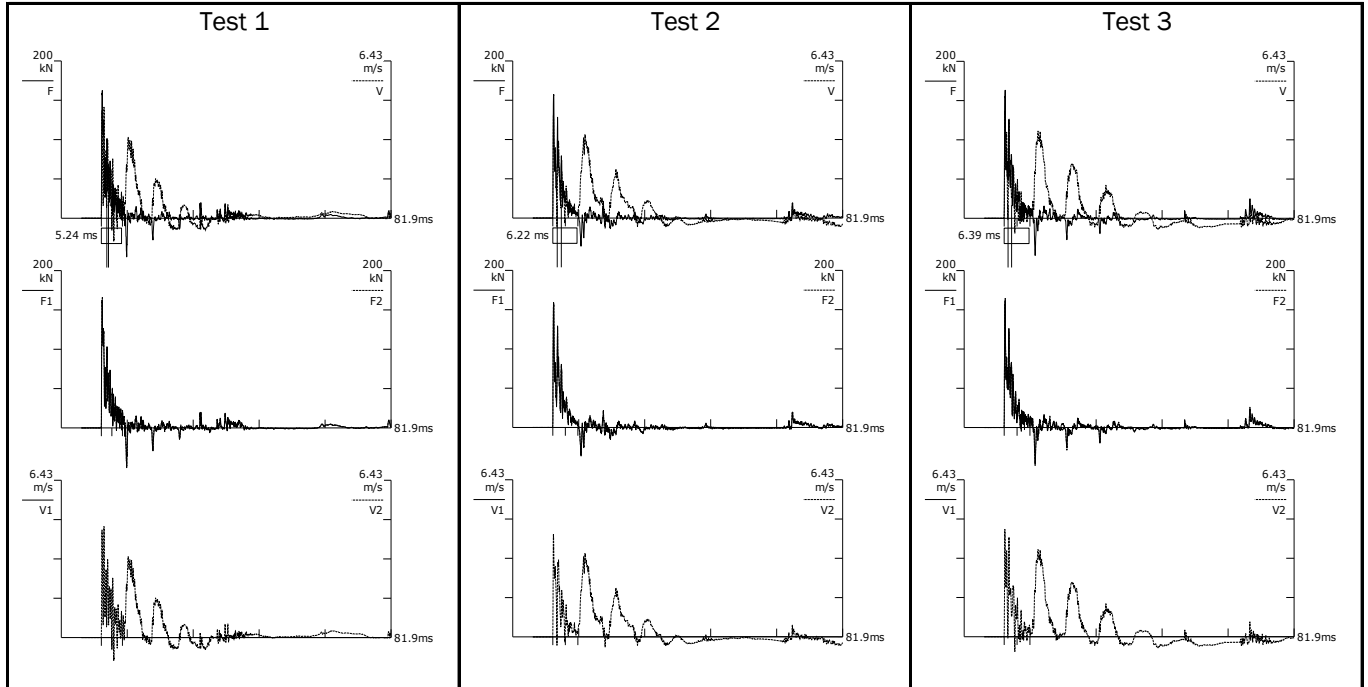
STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: N118-20220209

Standard: ASTM D4633-10

Date: 9/2/2022

Representative reports



STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: 383-20201013

Standard: ASTM D4633-10

Date: 13/10/2020

Geotechnical hammer

Type: Safety Auto	Maker: Comacchio	Mass: 63.5kg	Hammer ID: 383
Anvil dimensions: 50mm OD, 200mm long		Drop height: 760mm	
Notes:			

Instrumented rod

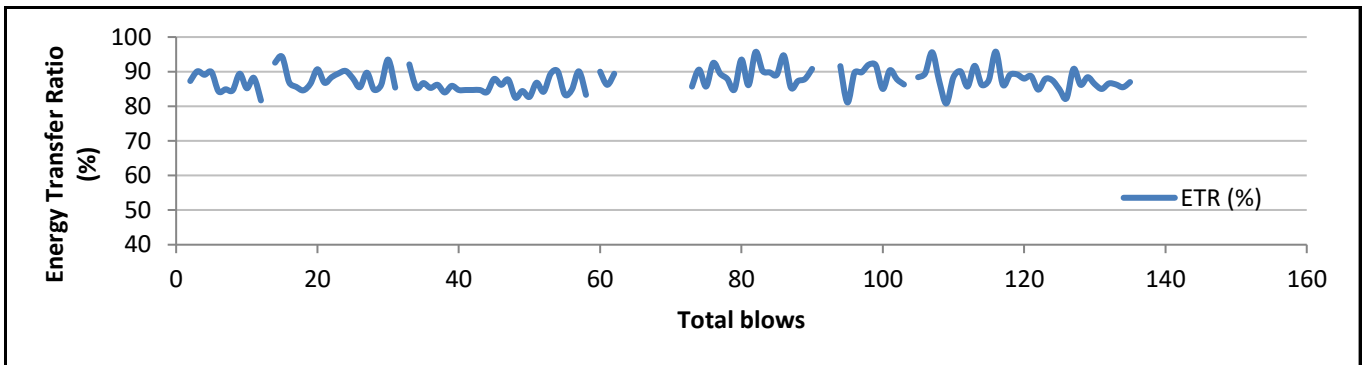
Serial: 346 AWJ - 1	Type: AWJ	Maker: Pile Dynamics, Inc.	Area: 7.70cm ²
Outer diameter: 44.5mm	Inner diameter: 15.9mm	Calibration date: 22/1/2019	
Strain sensor F3: 346-AWJ-1	Strain sensor F4: 346-AWJ-2	Calibration date: 22/1/2019	
Accelerometer A3: K3535	Accelerometer A4: K10904	Calibration date: 27/8/2020	

Processing equipment

Model: PDA, SPT Analyzer	Maker: Pile Dynamics, Inc.	Calibration Date: 13/12/2018
Serial: 4077 TA	Sample size: 8k	Sample frequency: 100kHz

Tests

Job No. - Location	Testing site - Sweetcorn Place, Pukekohe				
Test No.	1	2	3	4	5
Borehole	BH001	BH001	BH001	BH001	BH001
Test date	9/10/2020	9/10/2020	9/10/2020	9/10/2020	9/10/2020
Test time	1:41 PM	2:03 PM	2:44 PM	3:10 PM	3:50 PM
Depth below ground level (LP)	6.30m	7.80m	9.30m	10.80m	12.30m
Depth below sensors (LE)	7.68m	9.12m	10.64m	12.16m	13.68m
No. blows	11	18	26	33	42
Average measured blows per minute	33.7	33.8	32.0	33.6	33.7
Average hammer energy efficiency:	86.7%	88.2%	85.8%	89.2%	87.8%



Total blows analysed	122	Average hammer energy efficiency	87.6%
Standard deviation	3.1		

Tested by: Luan Cervantes

Signature: _____

Checked by: Massimo Rinaldo

Signature: _____

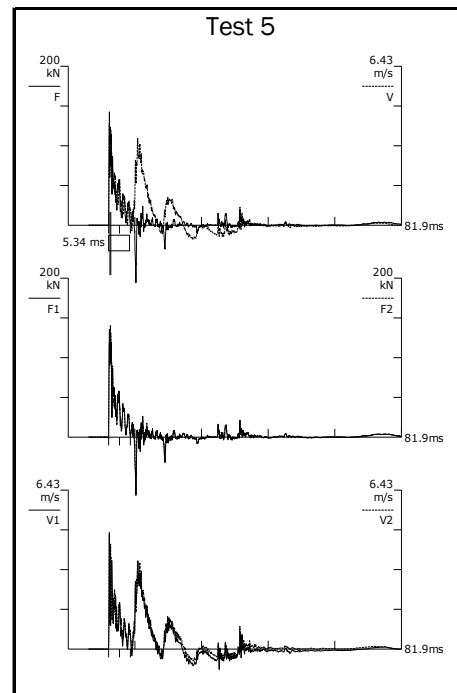
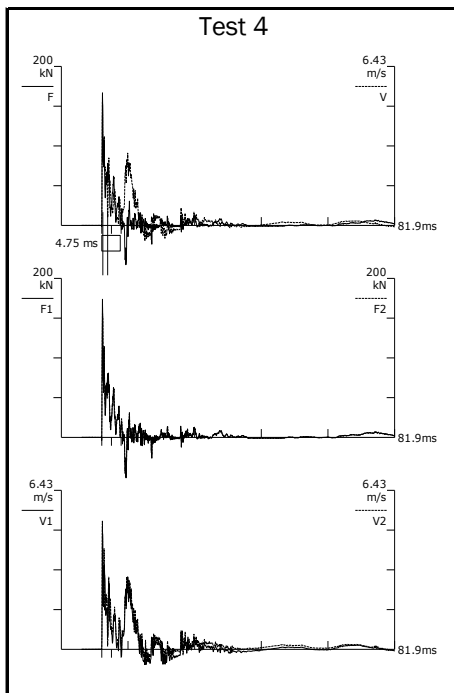
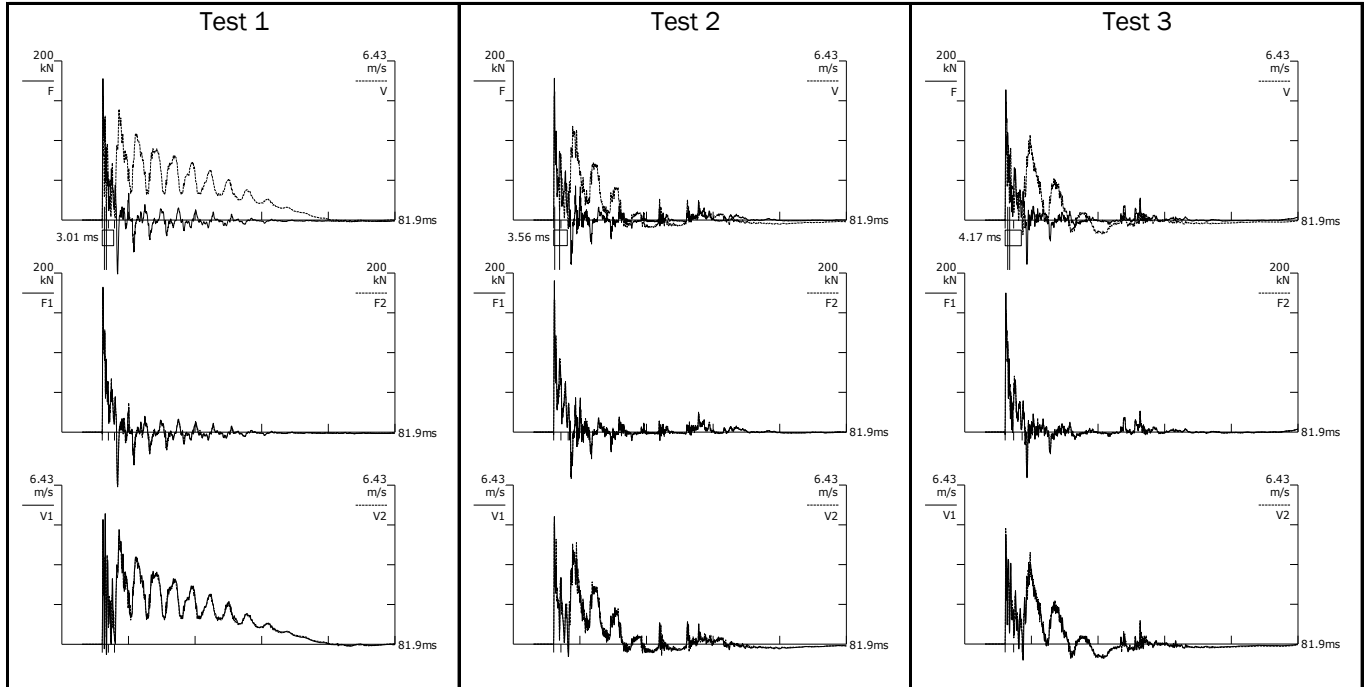
STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: 383-20201013

Standard: ASTM D4633-10

Date: 13/10/2020

Representative reports



STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: 383-20200217

Standard: ASTM D4633-10

Date: 17/2/2020

Geotechnical hammer

Type: Safety Auto	Maker: Comacchio	Mass: 63.5kg	Hammer ID: 383
Anvil dimensions: 50mm OD, 200mm long		Drop height: 760mm	
Notes:			

Instrumented rod

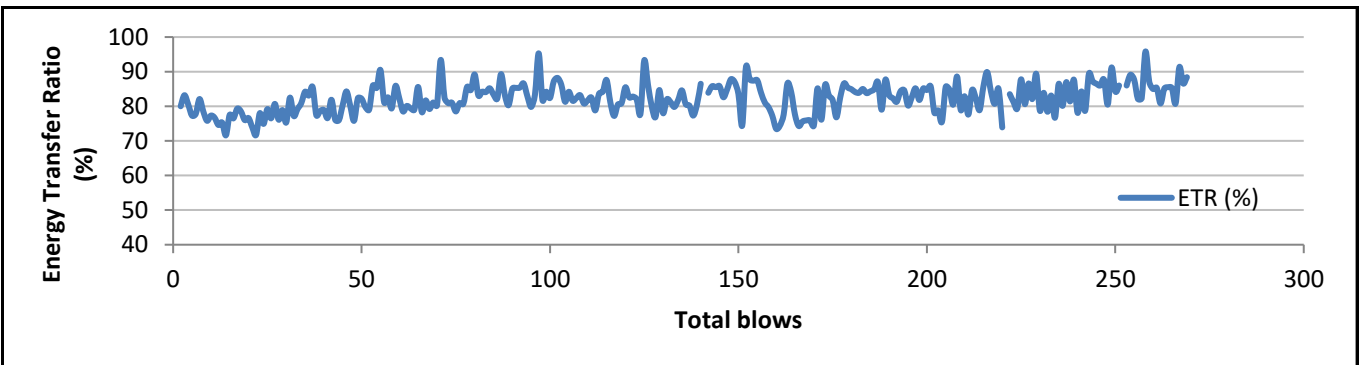
Serial: 346 AWJ - 1	Type: AWJ	Maker: Pile Dynamics, Inc.	Area: 7.70cm ²
Outer diameter: 44.5mm	Inner diameter: 15.9mm	Calibration date: 22/1/2019	
Strain sensor F3: 346-AWJ-1	Strain sensor F4: 346-AWJ-2	Calibration date: 22/1/2019	
Accelerometer A3: K3535	Accelerometer A4: K3536	Calibration date: 12/12/2018	

Processing equipment

Model: PDA, SPT Analyzer	Maker: Pile Dynamics, Inc.	Calibration Date: 13/12/2018
Serial: 4077 TA	Sample size: 8k	Sample frequency: 100kHz

Tests

Job No. - Location	36 Hickory Place, Christchurch				
Test No.	1	2	3	4	5
Borehole	BH001	BH001	BH001	BH001	BH001
Test date	14/2/2020	14/2/2020	15/2/2020	15/2/2020	15/2/2020
Test time	4:52 PM	5:20 PM	11:21 AM	1:35 PM	2:45 PM
Depth below ground level (LP)	2.40m	3.00m	6.70m	7.50m	9.20m
Depth below sensors (LE)	4.00m	4.90m	8.00m	9.40m	10.92m
No. blows	139	79	30	68	85
Average measured blows per minute	33.5	32.9	32.5	33.6	33.5
Average hammer energy efficiency:	81.2%	82.3%	83.7%	83.7%	80.9%



Total blows analysed	395	Average hammer energy efficiency	82.0%
Standard deviation	4.4		

Tested by: Massimo Rinaldo

Signature: Massimo Rinaldo

Checked by: Iain Haycock

Signature: [Signature]

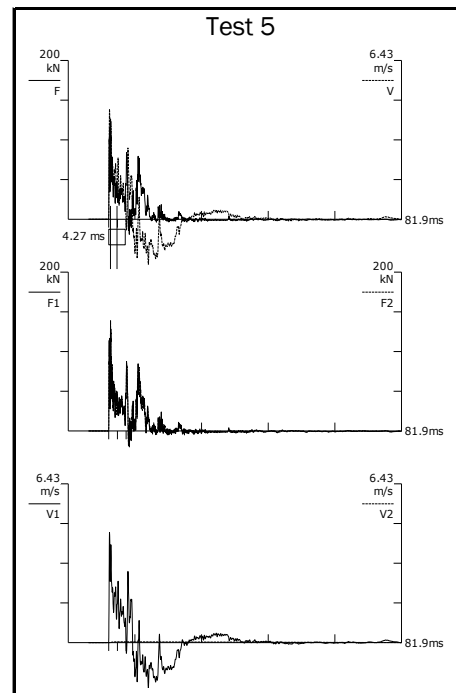
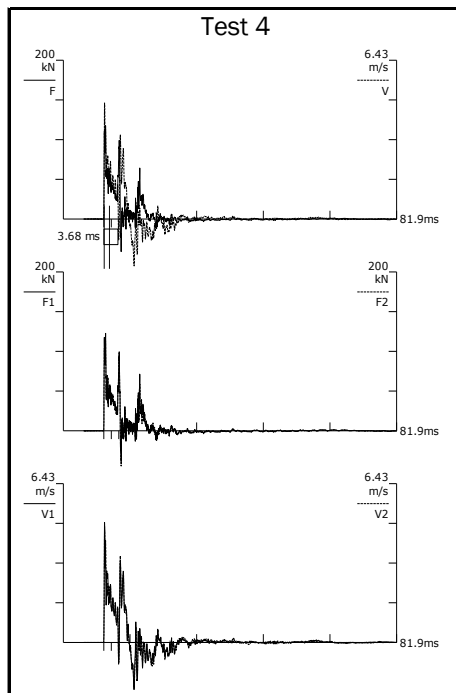
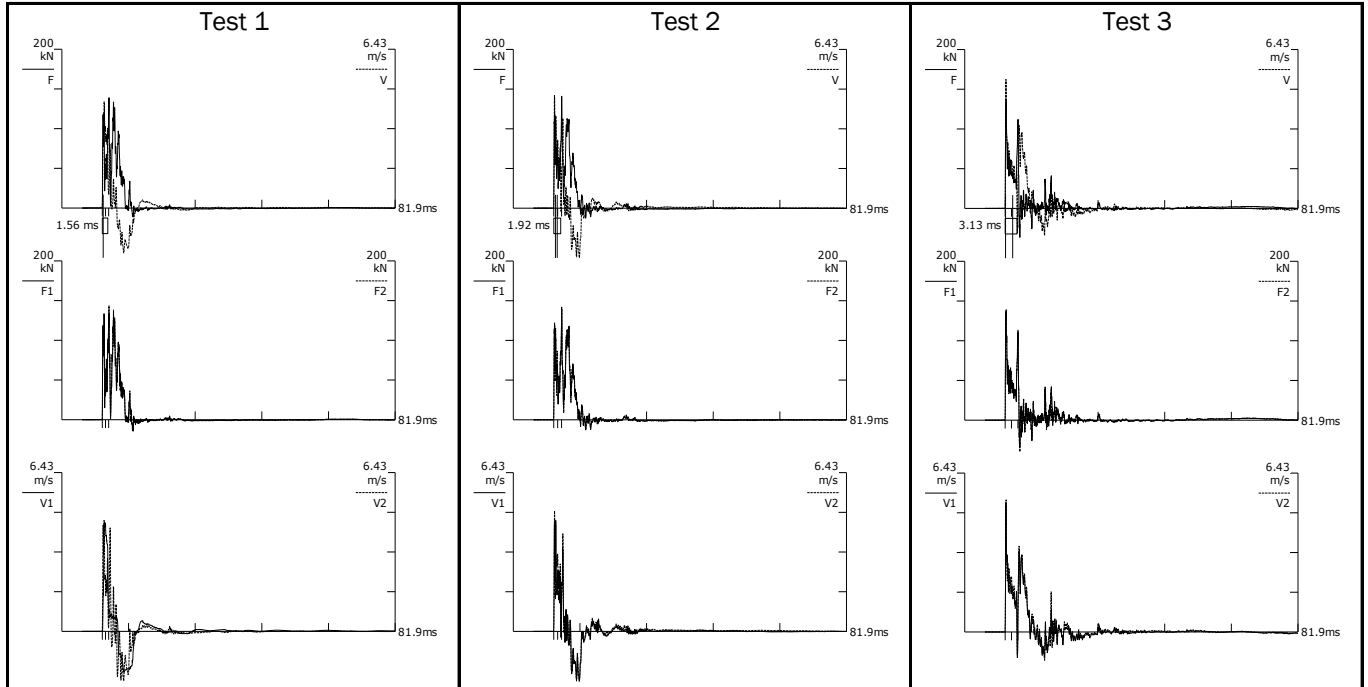
STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: 383-20200217

Standard: ASTM D4633-10

Date: 17/2/2020

Representative reports



STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: N119-20220712

Standard: ASTM D4633-10

Date: 12/7/2022

Geotechnical hammer

Type: Safety Auto	Maker: Comacchio	Mass: 63.5kg	Hammer ID: N119
Anvil dimensions: 50mm OD, 200mm long		Drop height: 760mm	
Notes:			

Instrumented rod

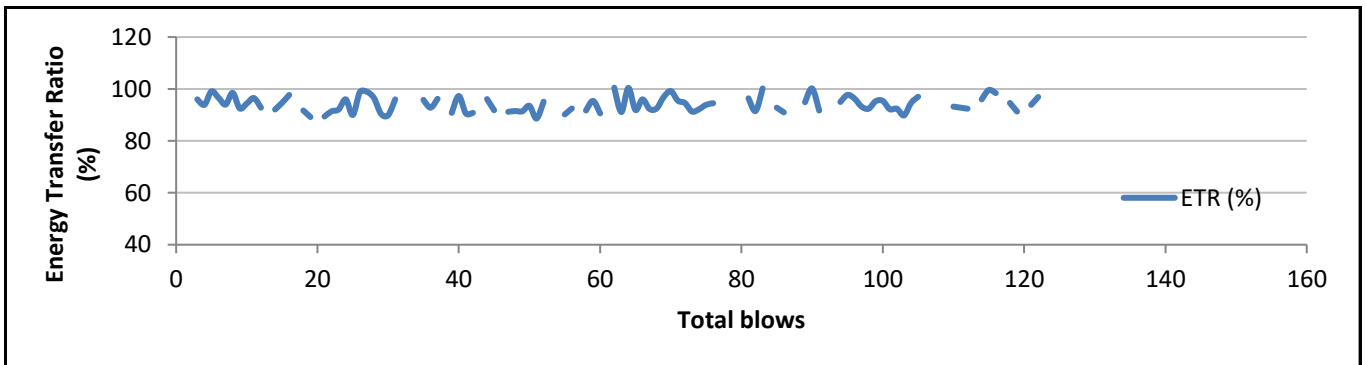
Serial: 346 AWJ - 1	Type: AWJ	Maker: Pile Dynamics, Inc.	Area: 7.70cm ²
Outer diameter: 44.5mm	Inner diameter: 15.9mm	Calibration date: 16/1/2021	
Strain sensor F3: 591AWJ-1	Strain sensor F4: 591AWJ-2	Calibration date: 16/1/2021	
Accelerometer A3: K3535	Accelerometer A4: K10904	Calibration date: 27/8/2020	

Processing equipment

Model: PDA, SPT Analyzer	Maker: Pile Dynamics, Inc.	Calibration Date: 13/12/2018
Serial: 4077 TA	Sample size: 8k	Sample frequency: 100kHz

Tests

Job No. - Location	Testing site - Sweetcorn Place, Pukekohe				
Test No.	1	2	3	4	5
Borehole	BH001	BH001	BH001	BH001	
Test date	30/6/2022	30/6/2022	30/6/2022	30/6/2022	
Test time	9:58 AM	10:25 AM	11:07 AM	11:47 AM	
Depth below ground level (LP)	9.30m	9.60m	11.10m	12.80m	
Depth below sensors (LE)	10.70m	11.15m	12.70m	14.25m	
No. blows	15	27	28	27	
Average measured blows per minute	32.8	34.1	34.3	32.6	
Average hammer energy efficiency:	94.6%	93.0%	94.3%	94.8%	



Total blows analysed	97	Average hammer energy efficiency	94.1%
Standard deviation	3.0		

Tested by: Jeremy Cain

Signature: 

Checked by: Greg Cossar

Signature: 

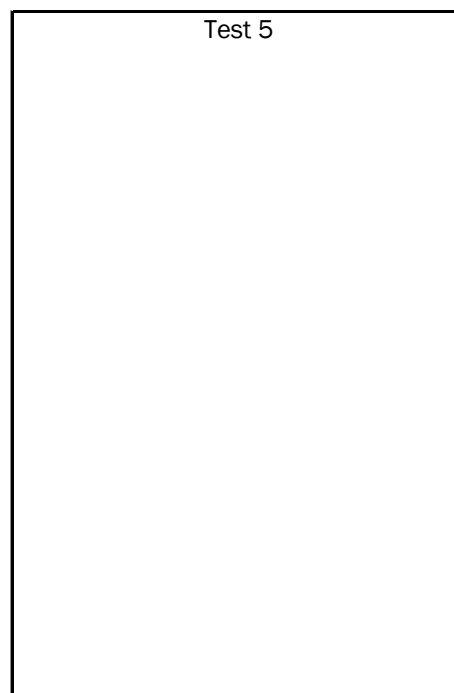
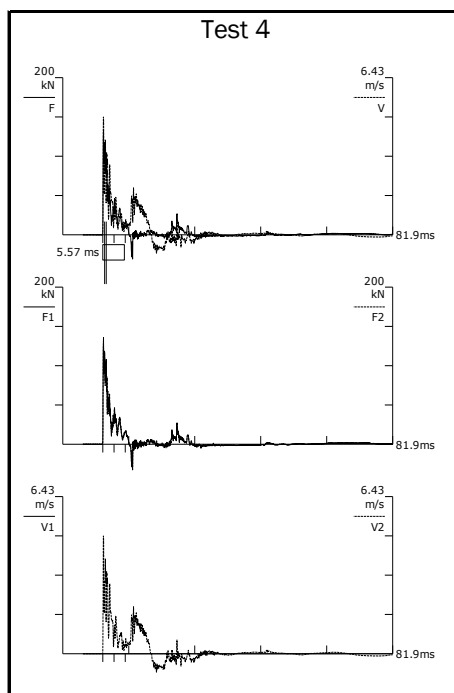
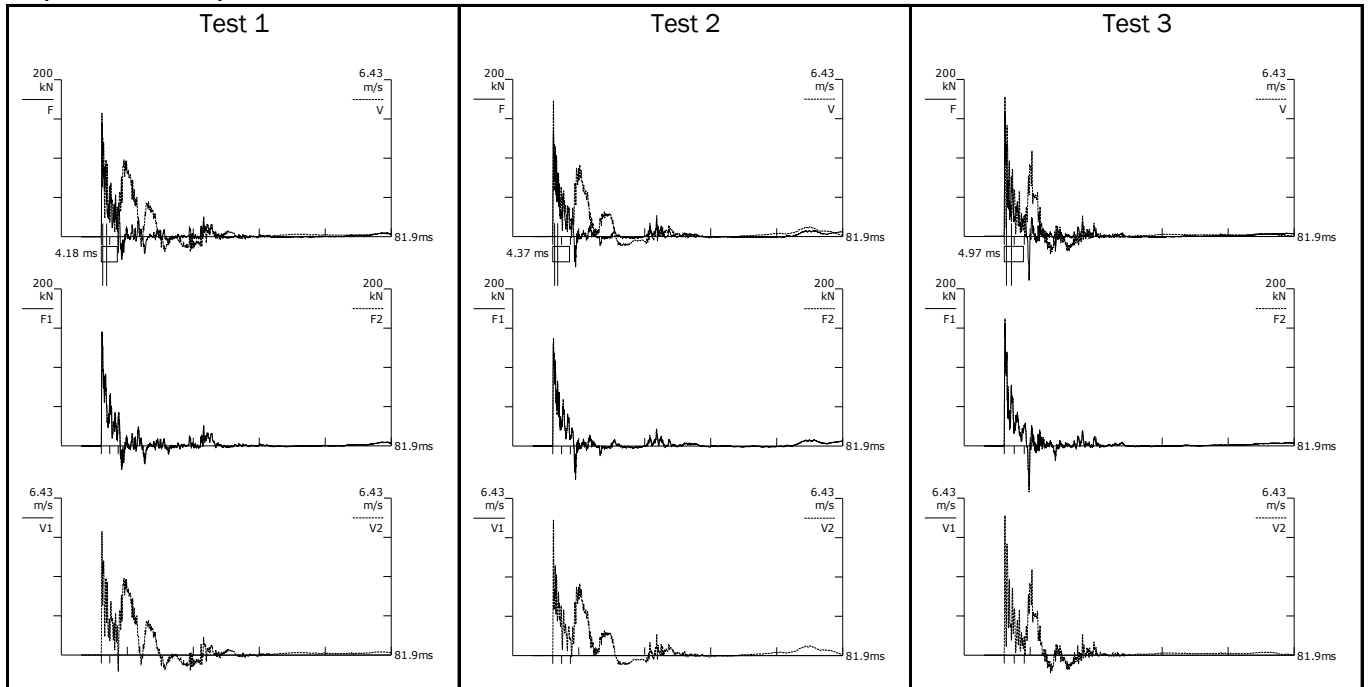
STANDARD PENETRATION TEST (SPT) HAMMER ENERGY MEASUREMENT CERTIFICATE

Certificate: N119-20220712

Standard: ASTM D4633-10

Date: 12/7/2022

Representative reports



Ground Investigation
Cone Calibration Certificates

calibration certificate

AC15CFIIPT.C18608 / 004



World's first manufacturer
of CPT equipment

Cone number	AC15CFIIPT.C18608	Client	Ground Investigation Ltd
Kind of cone	Compression		176 Bush Road
Calibration date	15-Apr-2021		Rosedale
			0632 Auckland
			New Zealand

Channel 1			Channel 2			Channel 3		
Cone resistance (q_c)			Local sleeve friction (f_s)			Pore pressure (u)		
$q_c = Q_c / A_c$			$f_s = F_s / A_s$					
Range	0 ... 150 kN		Range	0 ... 45 kN		Range	0 ... 50 bar	
A_c	1500 mm ²		A_s	22500 mm ²		Zero load reading	191 mV	
Zero load reading	218 mV		Zero load reading	204 mV				
a-factor	0.8		b-factor	0				
Offset			Offset	95 mm				

Q_c Load (kN)	Eqv. q_c (MPa)	Output (mV)	F_s Load (kN)	Eqv. f_s (MPa)	Output (mV)	Pressure (bar)	Eqv. u (MPa)	Output (mV)
0	0	0	0.0	0.0	0	0	0.0	0
15	10	789	4.5	0.2	810	5	0.5	829
30	20	1577	9.0	0.4	1612	10	1.0	1662
45	30	2365	13.5	0.6	2418	15	1.5	2491
60	40	3153	18.0	0.8	3231	20	2.0	3323
75	50	3941	22.5	1.0	4034	25	2.5	4151
90	60	4727	27.0	1.2	4837	30	3.0	4978
105	70	5513	31.5	1.4	5635	35	3.5	5801
120	80	6298	36.0	1.6	6432	40	4.0	6625
135	90	7083	40.5	1.8	7225	45	4.5	7455
150	100	7867	45.0	2.0	8023	50	5.0	8273
135	90	7085	40.5	1.8	7242			
120	80	6301	36.0	1.6	6448			
105	70	5516	31.5	1.4	5656			
90	60	4732	27.0	1.2	4863			
75	50	3945	22.5	1.0	4067			
60	40	3156	18.0	0.8	3264			
45	30	2367	13.5	0.6	2458			
30	20	1580	9.0	0.4	1653			
15	10	789	4.5	0.2	837			
0	0	-1	0.0	0.0	0			

Zero load error	0.01 %	Zero load error	0.00 %	Zero load error	0.01 %
Max. linearity	0.15 %	Max. linearity	0.69 %	Max. linearity	0.18 %
Max. hysteresis	0.06 %	Max. hysteresis	0.51 %		

calibration certificate

AC15CFIIP.T.C18608 / 004

Channel 4		Channel 5		Channel 6	
Inclination X		Inclination Y		Temperature (tmp)	
Range		Range		Range	
-20 ... 20 °		-20 ... 20 °		0 ... 50 ° C	
Angle (°)	Output (mV)	Angle (°)	Output (mV)	Temp (°C)	Output (mV)
-20	2553	-20	2500	0	56
-15	2623	-15	2568	5	950
-10	2702	-10	2645	10	1742
-5	2776	-5	2715	15	2640
0	2853	0	2797	20	3453
5	2927	5	2867	25	4254
10	3002	10	2939	30	5190
15	3080	15	3018	35	5955
20	3148	20	3082	40	6816
				45	7668
				50	8517

Calibration instrument(s)
GCU1000/1-091026-249/1

Certificate number(s)
2498603.00501.1

Date(s)
11-Jun-2020

Remark

We declare that the electrical cone with serial number AC15CFIIP.T.C18608 has been calibrated and that the specifications are according to the ISO 22476-1:2012/Cor 1:2013 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test). The calibrations are traceable to national and international standards.

Date
Calibrated by

15-Apr-2021
T. van Arnhem

Date
Approved by

15-Apr-2021
M. Kints

Signature



Signature



calibration certificate

AC15CFIIPT.C18611 / 004



World's first manufacturer of CPT equipment

Cone number	AC15CFIIPT.C18611	Client	Ground Investigation Ltd
Kind of cone	Compression		176 Bush Road
Calibration date	15-Apr-2021		Rosedale
			0632 Auckland
			New Zealand

Channel 1			Channel 2			Channel 3		
	Cone resistance (q_c)			Local sleeve friction (f_s)			Pore pressure (u)	
	$q_c = Q_c / A_c$			$f_s = F_s / A_s$				
Range	0 ... 150 kN		Range	0 ... 45 kN		Range	0 ... 50 bar	
A_c	1500 mm ²		A_s	22500 mm ²		Zero load reading	196 mV	
Zero load reading	186 mV		Zero load reading	197 mV				
a-factor	0.8		b-factor	0				
			Offset	95 mm				
Q_c Load (kN)	Eqv. q_c (MPa)	Output (mV)	F_s Load (kN)	Eqv. f_s (MPa)	Output (mV)	Pressure (bar)	Eqv. u (MPa)	Output (mV)
0	0	0	0.0	0.0	0	0	0.0	0
15	10	793	4.5	0.2	846	5	0.5	853
30	20	1586	9.0	0.4	1684	10	1.0	1709
45	30	2377	13.5	0.6	2529	15	1.5	2566
60	40	3170	18.0	0.8	3369	20	2.0	3422
75	50	3963	22.5	1.0	4230	25	2.5	4275
90	60	4753	27.0	1.2	5077	30	3.0	5141
105	70	5543	31.5	1.4	5921	35	3.5	5993
120	80	6332	36.0	1.6	6764	40	4.0	6846
135	90	7121	40.5	1.8	7603	45	4.5	7705
150	100	7909	45.0	2.0	8443	50	5.0	8549
135	90	7122	40.5	1.8	7632			
120	80	6333	36.0	1.6	6791			
105	70	5544	31.5	1.4	5955			
90	60	4755	27.0	1.2	5115			
75	50	3964	22.5	1.0	4271			
60	40	3173	18.0	0.8	3424			
45	30	2382	13.5	0.6	2581			
30	20	1588	9.0	0.4	1726			
15	10	795	4.5	0.2	866			
0	0	-1	0.0	0.0	-1			
Zero load error	0.01 %		Zero load error	0.01 %		Zero load error	0.00 %	
Max. linearity	0.12 %		Max. linearity	0.59 %		Max. linearity	0.14 %	
Max. hysteresis	0.06 %		Max. hysteresis	0.65 %				

calibration certificate

AC15CFIIP.T.C18611 / 004

Channel 4		Channel 5		Channel 6	
Inclination X		Inclination Y		Temperature (tmp)	
Range		Range		Range	
-20 ... 20 °		-20 ... 20 °		0 ... 50 ° C	
Angle (°)	Output (mV)	Angle (°)	Output (mV)	Temp (°C)	Output (mV)
-20	2495	-20	2485	0	16
-15	2565	-15	2552	5	66
-10	2636	-10	2628	10	117
-5	2713	-5	2702	15	167
0	2796	0	2816	20	215
5	2857	5	2852	25	265
10	2935	10	2929	30	316
15	3009	15	3006	35	366
20	3068	20	3068	40	416
				45	471
				50	517

Calibration instrument(s)
GCU1000/1-091026-249/1

Certificate number(s)
2498603.00501.1

Date(s)
11-Jun-2020

Remark

We declare that the electrical cone with serial number AC15CFIIP.T.C18611 has been calibrated and that the specifications are according to the ISO 22476-1:2012/Cor 1:2013 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test). The calibrations are traceable to national and international standards.

Date
Calibrated by

15-Apr-2021
T. van Arnhem

Date
Approved by

15-Apr-2021
M. Kints

Signature



Signature



calibration certificate

AC15CFIIPT.C18614 / 004



World's first manufacturer
of CPT equipment

Cone number	AC15CFIIPT.C18614	Client	Ground Investigation Ltd
Kind of cone	Compression		176 Bush Road
Calibration date	15-Apr-2021		Rosedale
			0632 Auckland
			New Zealand

Channel 1			Channel 2			Channel 3		
Cone resistance (q_c)			Local sleeve friction (f_s)			Pore pressure (u)		
$q_c = Q_c / A_c$			$f_s = F_s / A_s$					
Range	0 ... 150 kN		Range	0 ... 45 kN		Range	0 ... 50 bar	
A_c	1500 mm ²		A_s	22500 mm ²		Zero load reading	209 mV	
Zero load reading	200 mV		Zero load reading	206 mV				
a-factor	0.8		b-factor	0				
			Offset	95 mm				
Q_c Load (kN)	Eqv. q_c (MPa)	Output (mV)	F_s Load (kN)	Eqv. f_s (MPa)	Output (mV)	Pressure (bar)	Eqv. u (MPa)	Output (mV)
0	0	0	0.0	0.0	0	0	0.0	0
15	10	797	4.5	0.2	830	5	0.5	871
30	20	1596	9.0	0.4	1662	10	1.0	1751
45	30	2395	13.5	0.6	2505	15	1.5	2627
60	40	3187	18.0	0.8	3342	20	2.0	3501
75	50	3985	22.5	1.0	4186	25	2.5	4374
90	60	4777	27.0	1.2	5022	30	3.0	5249
105	70	5574	31.5	1.4	5856	35	3.5	6119
120	80	6368	36.0	1.6	6689	40	4.0	7005
135	90	7161	40.5	1.8	7522	45	4.5	7872
150	100	7954	45.0	2.0	8350	50	5.0	8747
135	90	7163	40.5	1.8	7535			
120	80	6371	36.0	1.6	6704			
105	70	5577	31.5	1.4	5876			
90	60	4783	27.0	1.2	5045			
75	50	3988	22.5	1.0	4206			
60	40	3192	18.0	0.8	3365			
45	30	2396	13.5	0.6	2535			
30	20	1599	9.0	0.4	1696			
15	10	800	4.5	0.2	847			
0	0	0	0.0	0.0	-1			
Zero load error	0.00 %		Zero load error	0.01 %		Zero load error	0.01 %	
Max. linearity	0.14 %		Max. linearity	0.42 %		Max. linearity	0.09 %	
Max. hysteresis	0.08 %		Max. hysteresis	0.41 %				

calibration certificate

AC15CFIIP.T.C18614 / 004

Channel 4		Channel 5		Channel 6	
Inclination X		Inclination Y		Temperature (tmp)	
Range		Range		Range	
-20 ... 20 °		-20 ... 20 °		0 ... 50 ° C	
Angle (°)	Output (mV)	Angle (°)	Output (mV)	Temp (°C)	Output (mV)
-20	2523	-20	2510	0	0
-15	2592	-15	2579	5	44
-10	2667	-10	2656	10	99
-5	2739	-5	2729	15	127
0	2817	0	2800	20	174
5	2893	5	2871	25	228
10	2967	10	2943	30	276
15	3042	15	3022	35	328
20	3108	20	3089	40	379
				45	425
				50	478

Calibration instrument(s)
GCU1000/1-091026-249/1

Certificate number(s)
2498603.00501.1

Date(s)
11-Jun-2020

Remark

We declare that the electrical cone with serial number AC15CFIIP.T.C18614 has been calibrated and that the specifications are according to the ISO 22476-1:2012/Cor 1:2013 (Geotechnical investigation and testing – Field testing - Part 1: Electrical cone and piezocone penetration test). The calibrations are traceable to national and international standards.

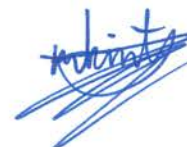
Date 15-Apr-2021
Calibrated by T. van Arnhem

Date 15-Apr-2021
Approved by M. Kints

Signature



Signature



Certificate of Calibration

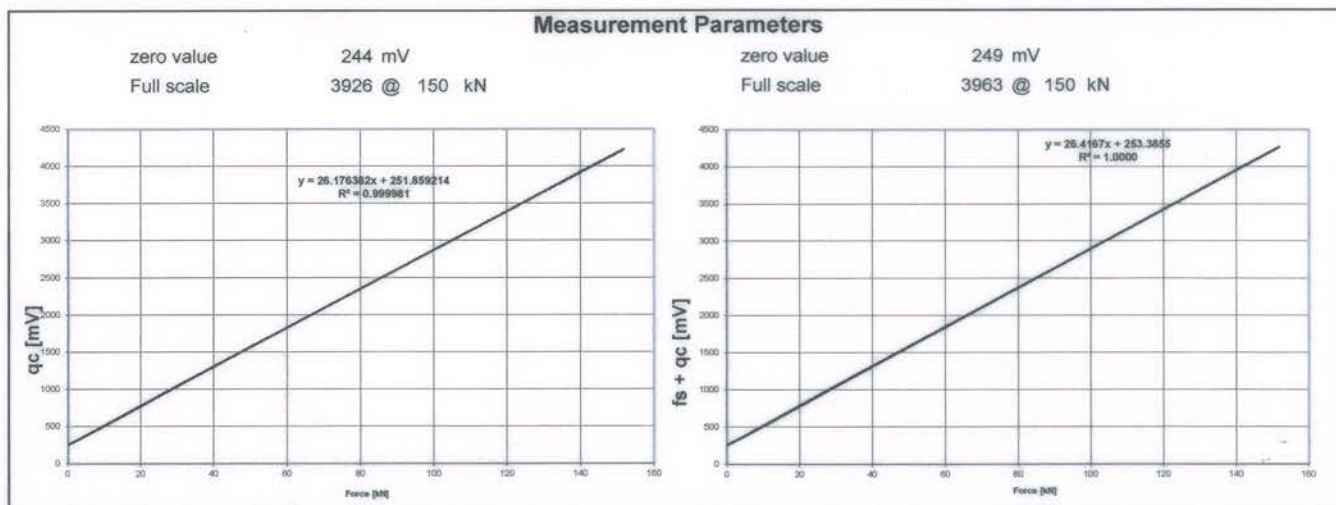
Certificate No. CMI 21.08.4073

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V	Date Calibrated: 9-8-2021
Model No.:	DP15-CFPTxy	Next Due Date: 9-2-2022
Serial No.:	70169	
Cone area factor:	0,75	
Used Calibration Procedure: GGCEP004, ISO22476		Location: Hillegom (The Netherlands)

Customer
Ground Investigation Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 668966 + 695054
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 17 June, 2021	Date Calibrated: 17 June, 2021	Date Calibrated: 16 June, 2021
Next Due Date: 17 December, 2021	Next Due Date: 17 December, 2021	Next Due Date: 16 June, 2022
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 21.06.3920	Traceability: CMI 21.06.3919	Traceability: 2106160027

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Tempera:	22.9 °C
	Relative Humidity:	49.6 %
Condition of Calibrated Apparatus when Received: Fair		



Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Nederlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO22476.

The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:	Approved by:
Vincent Vermeer (Engineer)	Rogier Tijm (Senior Engineer)

Certificate of Calibration

Certificate No. CMI 21.08.4073

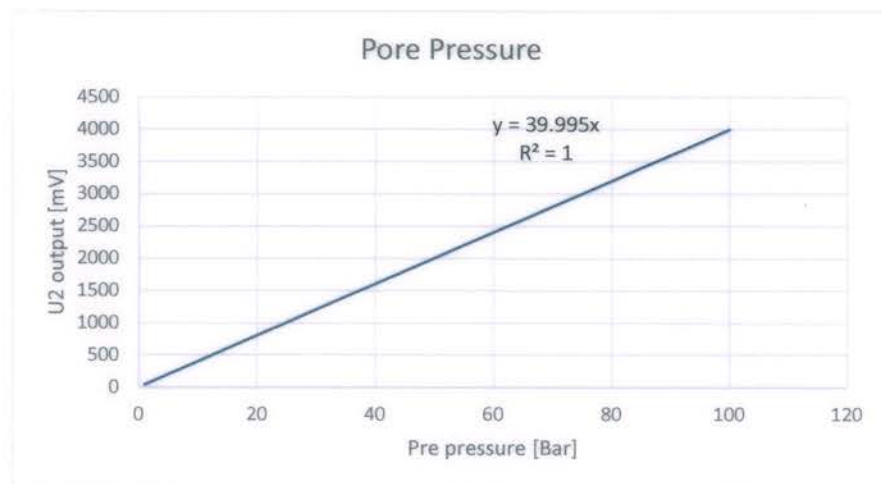
Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 9-8-2021
Manufacturer:	Gouda Geo-Equipment B.V.	Next Due Date: 9-2-2022
Model No.:	DP15-CFPTxy	
Serial No.:	70169	
Cone area factor:	0,75	
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)

Calibration Instruments	
Instrument Type:	HP Kalibrator
Manufacturer:	Keller Druckmesstechnik
Model No.:	HPX - 200bar - 80139.31
Serial No.:	10311
Date Calibrated:	19 May, 2021
Next Due Date:	19 May, 2022
Calibrated By:	Manufacturer

Pore pressure

AMB \pm 1Bar = 336 Mv

U2 [bar]	U2 [mV]
1	41
5	200
10	400
15	602
20	802
25	1006
30	1208
35	1406
40	1605
45	1804
50	2004
55	2204
60	2402
65	2603
70	2802
75	2997
80	3199
85	3399
90	3595
95	3793
100	3993



Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)



Gouda Geo-Equipment B.V.
Satellietbaan 8
2181 MH Hillegom
The Netherlands

Tel. + 31 (0)715.318.475
E-mail: info@gouda-geo.com

Certificate of Calibration

Certificate No. CMI 21.08.4073

Instrument

Instrument Type: Electrical Subtraction Cone
Manufacturer: Gouda Geo-Equipment B.V.
Model No.: DP15-CFPTxy
Serial No.: 70169
Cone area factor: 0,75

Calibration Result: Certified

Date Calibrated: 9-8-2021
Next Due Date: 9-2-2022

Used Calibration Procedure: GGECP004, ISO22476

Location: Hillegom (The Netherlands)

Inclinometer

Degrees	ix [mV]
20	3067
19	3028
18	2979
17	2945
16	2896
15	2852
14	2813
13	2774
12	2734
11	2686
10	2642
9	2593
8	2554
7	2505
6	2466
5	2423
4	2379
3	2335
2	2286
1	2242
0	2198
-1	2164
-2	2115
-3	2071
-4	2027
-5	1979
-6	1939
-7	1891
-8	1856
-9	1812
-10	1768
-11	1725
-12	1680
-13	1637
-14	1593
-15	1554
-16	1514
-17	1475
-18	1426
-19	1388
-20	1344

Degrees	Iy [mV]
20	3369
19	3320
18	3272
17	3227
16	3183
15	3130
14	3100
13	3052
12	3002
11	2954
10	2905
9	2861
8	2812
7	2778
6	2725
5	2681
4	2627
3	2578
2	2529
1	2486
0	2442
-1	2393
-2	2344
-3	2290
-4	2246
-5	2198
-6	2159
-7	2115
-8	2061
-9	2017
-10	1963
-11	1919
-12	1871
-13	1836
-14	1783
-15	1739
-16	1695
-17	1641
-18	1602
-19	1553
-20	1519

Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

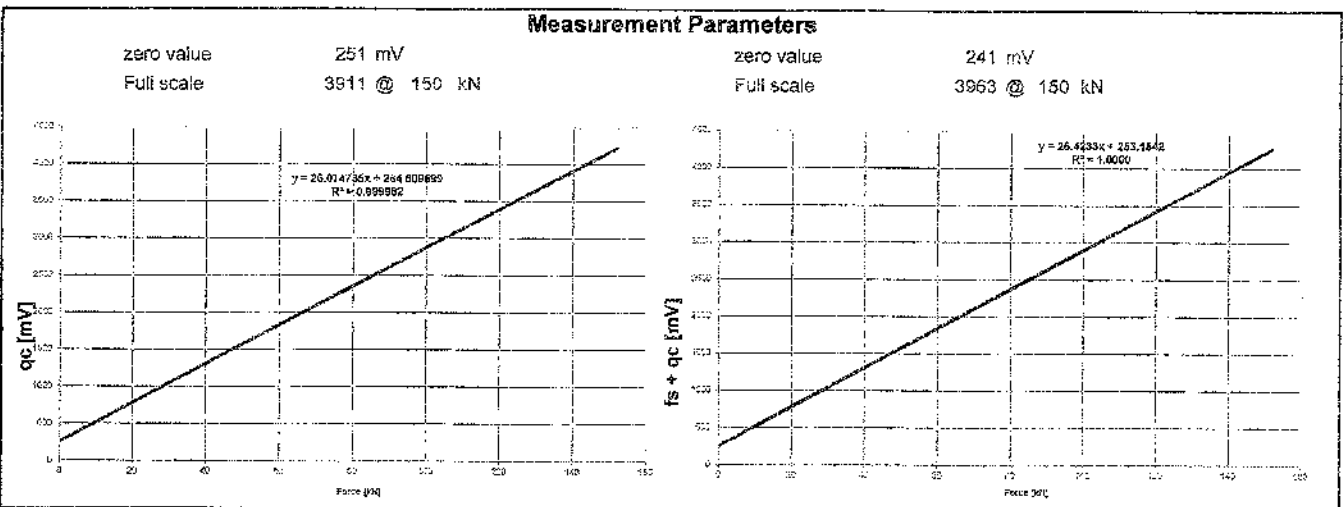
Certificate No. CMI 21.07.3968

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V.	Date Calibrated: 5-7-2021
Model No.:	DP15-CFPTxy	Next Due Date: 5-1-2022
Serial No.:	71062	
Cone area factor:	0,75	
Used Calibration Procedure:	GGECP004, ISO22476	Location: Hillegom (The Netherlands)

Customer
Ground Investigation Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + CSG110
Serial No.: 3010	Serial No.: 3129	Serial No.: 232191 + 574077
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 17 June, 2021	Date Calibrated: 17 June, 2021	Date Calibrated: 27 July, 2020
Next Due Date: 17 December, 2021	Next Due Date: 17 December, 2021	Next Due Date: 27 July, 2021
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 21.06.3920	Traceability: CMI 21.06.3919	Traceability: 2007270063

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Tempera:	22.1 °C
Condition of Calibrated Apparatus when Received: Fair	Relative Humidity:	50.3 %



Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Netherlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO22476.

The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:	Approved by:
Vincent Vermeer (Engineer)	Rogier Tijm (Senior Engineer)



Gouda Geo-Equipment B.V.
 Satellietbaan 8
 2181 MH Hillegom
 The Netherlands

Tel. + 31 (0)715.318.475
 E-mail: info@gouda-geo.com

Certificate of Calibration

Certificate No. CMI 21.07.3968

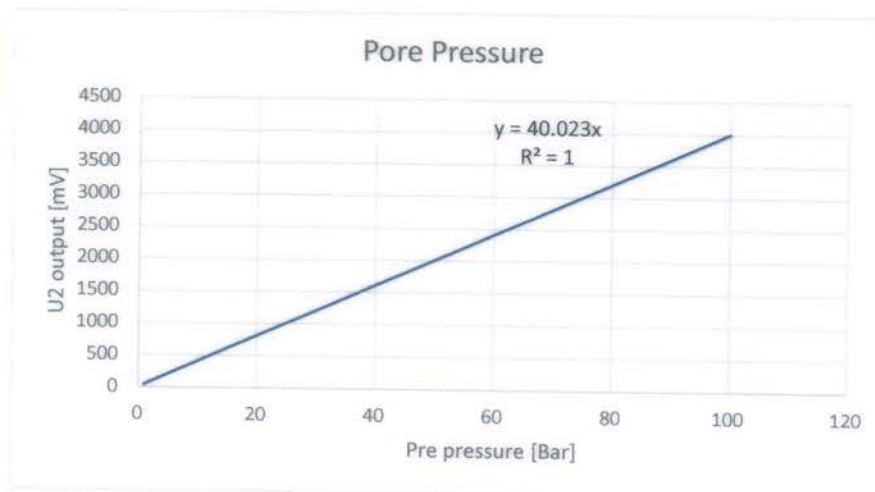
Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 5-7-2021
Manufacturer:	Gouda Geo-Equipment B.V	Next Due Date: 5-1-2022
Model No.:	DP15-CFPTxy	
Serial No.:	71062	
Cone area factor:	0,75	
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)

Calibration Instruments	
Instrument Type:	HP Kalibrator
Manufacturer:	Keller Druckmesstechnik
Model No.:	HPX - 200bar - 80139.31
Serial No.:	10311
Date Calibrated:	19 May, 2021
Next Due Date:	19 May, 2022
Calibrated By:	Manufacturer

Pore pressure

AMB \pm 1Bar = 302 Mv

U2 [bar]	U2 [mV]
1	40
5	201
10	402
15	605
20	804
25	1005
30	1205
35	1405
40	1605
45	1806
50	2005
55	2204
60	2405
65	2605
70	2802
75	3003
80	3202
85	3399
90	3599
95	3796
100	3994



Calibration performed by:

Vincent Vermeer
 (Engineer)

Approved by:

Rogier Tijm
 (Senior Engineer)



Gouda Geo-Equipment B.V.
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 E-mail: info@gouda-geo.com

Certificate of Calibration

Certificate No. CMI 21.07.3968

Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 5-7-2021
Manufacturer:	Gouda Geo-Equipment B.V.	Next Due Date: 5-1-2022
Model No.:	DP15-CFPTxy	
Serial No.:	71062	
Cone area factor:	0,75	
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)

Inclinometer

Degrees	Ix [mV]	Degrees	Iy [mV]
20	3105	20	3432
19	3071	19	3393
18	3022	18	3349
17	2978	17	3300
16	2934	16	3256
15	2890	15	3203
14	2851	14	3164
13	2807	13	3115
12	2773	12	3080
11	2724	11	3032
10	2685	10	2978
9	2637	9	2939
8	2593	8	2880
7	2545	7	2841
6	2500	6	2797
5	2466	5	2759
4	2417	4	2705
3	2378	3	2656
2	2324	2	2612
1	2285	1	2559
0	2237	0	2510
-1	2198	-1	2471
-2	2159	-2	2427
-3	2115	-3	2373
-4	2071	-4	2324
-5	2022	-5	2276
-6	1983	-6	2232
-7	1934	-7	2183
-8	1895	-8	2144
-9	1851	-9	2100
-10	1815	-10	2046
-11	1768	-11	2007
-12	1724	-12	1949
-13	1680	-13	1910
-14	1637	-14	1866
-15	1597	-15	1827
-16	1554	-16	1783
-17	1524	-17	1729
-18	1475	-18	1690
-19	1436	-19	1636
-20	1393	-20	1597

Calibration performed by:

Vincent Vermeer
 (Engineer)

Approved by:

Rogier Tijm
 (Senior Engineer)

Certificate of Calibration

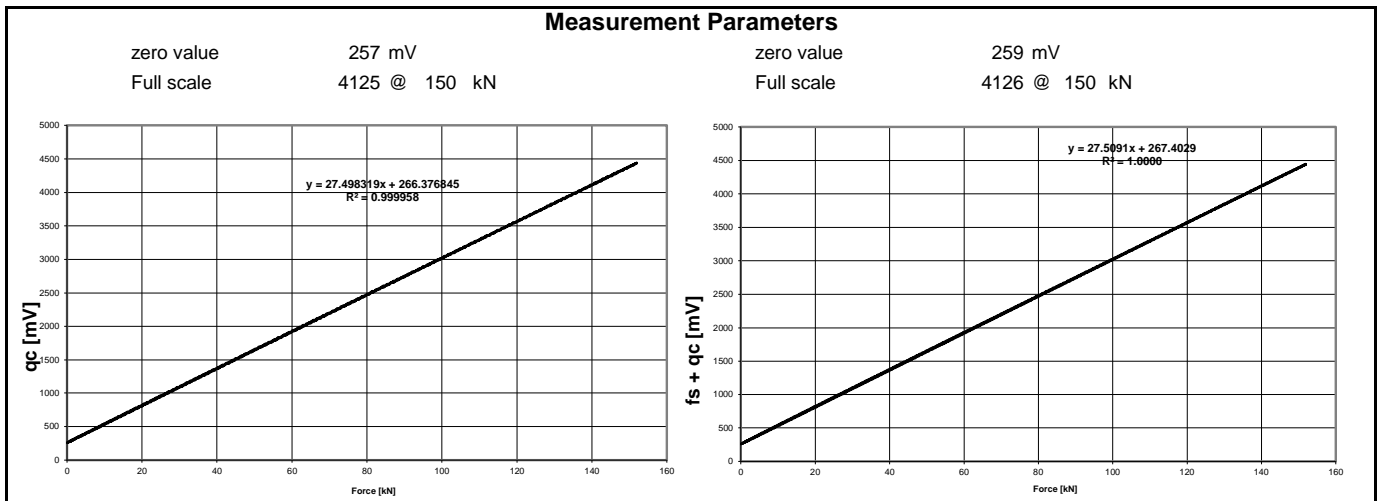
Certificate No. CMI 21.01.3667

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V	Date Calibrated: 15-1-2021
Model No.:	DP15-CFPTxy	Next Due Date: 15-7-2021
Serial No.:	71136	
Cone area factor:	0,75	
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)

Customer
Ground Investigation Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + CSG110
Serial No.: 3010	Serial No.: 3129	Serial No.: 232191 + 574077
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 11 September, 2020	Date Calibrated: 4 January, 2021	Date Calibrated: 27 July, 2020
Next Due Date: 11 March, 2021	Next Due Date: 4 July, 2021	Next Due Date: 27 July, 2021
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 20.09.3375	Traceability: CMI 21.01.3648	Traceability: 2007270063

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Temperature	17.8 °C
	Relative Humidity:	31.5 %
Condition of Calibrated Apparatus when Received: Fair		



Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Nederlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO22476.

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Calibration performed by:	Approved by:
Vincent Vermeer (Engineer)	Rogier Tijm (Senior Engineer)

Certificate of Calibration

Certificate No. CMI 21.01.3667

Instrument

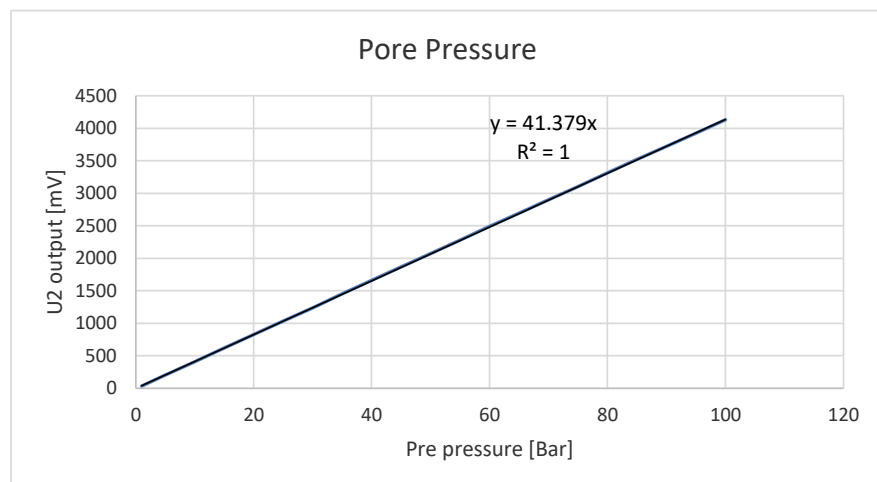
Instrument Type:	Electrical Subtraction Cone	Calibration Result:	Certified
Manufacturer:	Gouda Geo-Equipment B.V.	Date Calibrated:	15-1-2021
Model No.:	DP15-CFPTxy	Next Due Date:	15-7-2021
Serial No.:	71136		
Cone area factor:	0,75		
Used Calibration Procedure:	GGECP004, ISO22476	Location:	Hillegom (The Netherlands)

Calibration Instruments

Instrument Type: HP Kalibrator
 Manufacturer: Keller Druckmesstechnik
 Model No.: HPX - 200bar - 80139.31
 Serial No.: 5208
 Date Calibrated: 30 April, 2020
 Next Due Date: 30 April, 2021
 Calibrated By: Manufacturer

Pore pressure

AMB = +/-1Bar = 324 Mv	
U2 [bar]	U2 [mV]
1	35
5	202
10	411
15	618
20	829
25	1035
30	1238
35	1453
40	1657
45	1866
50	2072
55	2280
60	2490
65	2691
70	2900
75	3102
80	3311
85	3518
90	3720
95	3925
100	4133



Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 21.01.3667

Instrument

Instrument Type:	Electrical Subtraction Cone	Calibration Result:	Certified
Manufacturer:	Gouda Geo-Equipment B.V	Date Calibrated:	15-1-2021
Model No.:	DP15-CFPTxy	Next Due Date:	15-7-2021
Serial No.:	71136		
Cone area factor:	0,75		
Used Calibration Procedure: GGCEP004, ISO22476		Location: Hillegom (The Netherlands)	

Inclinometer

Degrees	Ix [mV]
20	3091
19	3051
18	3007
17	2959
16	2920
15	2871
14	2832
13	2793
12	2754
11	2705
10	2656
9	2617
8	2568
7	2524
6	2476
5	2442
4	2388
3	2344
2	2300
1	2251
0	2212
-1	2168
-2	2129
-3	2080
-4	2037
-5	1988
-6	1944
-7	1900
-8	1861
-9	1822
-10	1773
-11	1729
-12	1680
-13	1641
-14	1592
-15	1558
-16	1519
-17	1475
-18	1431
-19	1383
-20	1348

Degrees	Iy [mV]
20	3398
19	3354
18	3310
17	3261
16	3217
15	3168
14	3125
13	3085
12	3041
11	2992
10	2944
9	2900
8	2846
7	2807
6	2764
5	2719
4	2665
3	2622
2	2573
1	2519
0	2480
-1	2436
-2	2392
-3	2334
-4	2290
-5	2241
-6	2197
-7	2158
-8	2109
-9	2065
-10	2012
-11	1968
-12	1914
-13	1875
-14	1831
-15	1787
-16	1743
-17	1694
-18	1650
-19	1602
-20	1563

Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

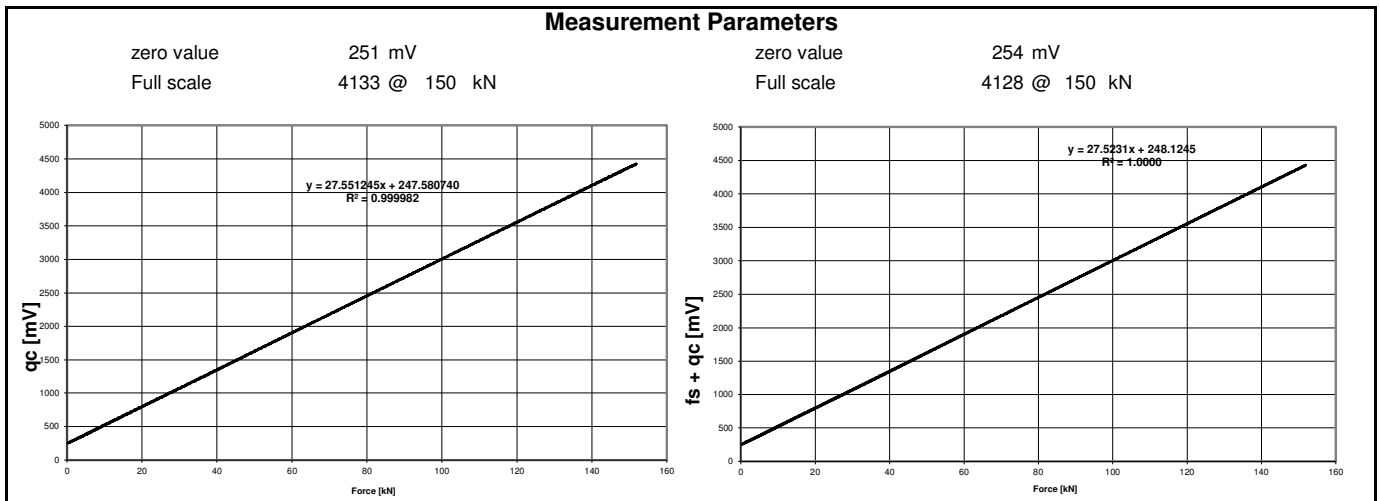
Certificate No. CMI 22.09.4947

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V	Date Calibrated: 26-9-2022
Model No.:	DP15-CFPTxy	Next Due Date: 26-3-2023
Serial No.:	71136	
Cone area factor:	0,75	
Used Calibration Procedure: GGCEP004, ISO22476		Location: Hillegom (The Netherlands)

Customer
Ground Investigation Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 1016780 + 1013883
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 28 June, 2022	Date Calibrated: 28 June, 2022	Date Calibrated: 24 March, 2022
Next Due Date: 28 December, 2022	Next Due Date: 28 December, 2022	Next Due Date: 24 March, 2023
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 22.06.4716	Traceability: CMI 22.06.4715	Traceability: 2203240009

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Temperature:	20.5 °C
	Relative Humidity:	47.1 %
Condition of Calibrated Apparatus when Received: Fair		



Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Netherlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO22476.

The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by: 
Vincent Vermeer
(Engineer)



Approved by: 
Rogier Tijn
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.09.4947

Instrument

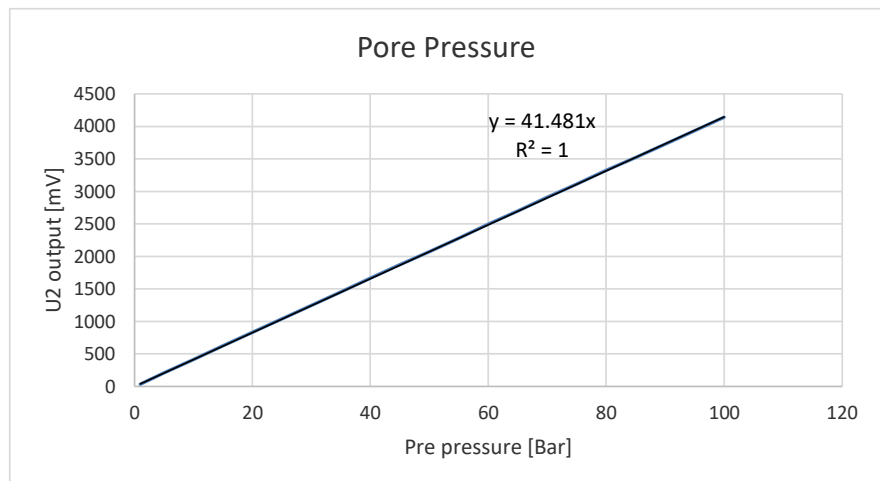
Instrument Type:	Electrical Subtraction Cone	Calibration Result:	Certified
Manufacturer:	Gouda Geo-Equipment B.V.	Date Calibrated:	26-9-2022
Model No.:	DP15-CFPTxy	Next Due Date:	26-3-2023
Serial No.:	71136		
Cone area factor:	0,75		
Used Calibration Procedure:	GGECP004, ISO22476	Location:	Hillegom (The Netherlands)

Calibration Instruments

Instrument Type: HP Kalibrator
 Manufacturer: Keller Druckmesstechnik
 Model No.: HPX - 200bar - 80139.31
 Serial No.: 5208
 Date Calibrated: 17 May, 2022
 Next Due Date: 17 May, 2023
 Calibrated By: Manufacturer

Pore pressure

AMB = +/-1Bar = 324 Mv	
U2 [bar]	U2 [mV]
1	35
5	205
10	415
15	623
20	834
25	1041
30	1247
35	1451
40	1662
45	1873
50	2074
55	2281
60	2496
65	2699
70	2908
75	3114
80	3322
85	3522
90	3729
95	3935
100	4141



Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijn
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.09.4947

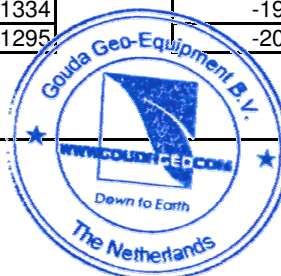
Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 26-9-2022
Manufacturer:	Gouda Geo-Equipment B.V.	Next Due Date: 26-3-2023
Model No.:	DP15-CFPTxy	
Serial No.:	71136	
Cone area factor:	0,75	
Used Calibration Procedure: GGCEP004, ISO22476		Location: Hillegom (The Netherlands)

Inclinometer

Degrees	Ix [mV]	Degrees	Iy [mV]
20	3022	20	3403
19	2983	19	3354
18	2940	18	3310
17	2895	17	3261
16	2851	16	3223
15	2812	15	3169
14	2778	14	3130
13	2730	13	3086
12	2685	12	3042
11	2637	11	2993
10	2598	10	2949
9	2549	9	2901
8	2500	8	2847
7	2466	7	2808
6	2422	6	2764
5	2378	5	2725
4	2329	4	2666
3	2291	3	2622
2	2237	2	2574
1	2198	1	2525
0	2159	0	2486
-1	2115	-1	2437
-2	2071	-2	2393
-3	2022	-3	2335
-4	1978	-4	2295
-5	1929	-5	2242
-6	1890	-6	2198
-7	1851	-7	2159
-8	1812	-8	2110
-9	1763	-9	2066
-10	1719	-10	2012
-11	1676	-11	1968
-12	1627	-12	1915
-13	1588	-13	1876
-14	1549	-14	1831
-15	1514	-15	1788
-16	1466	-16	1744
-17	1422	-17	1695
-18	1378	-18	1651
-19	1334	-19	1603
-20	1295	-20	1563

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

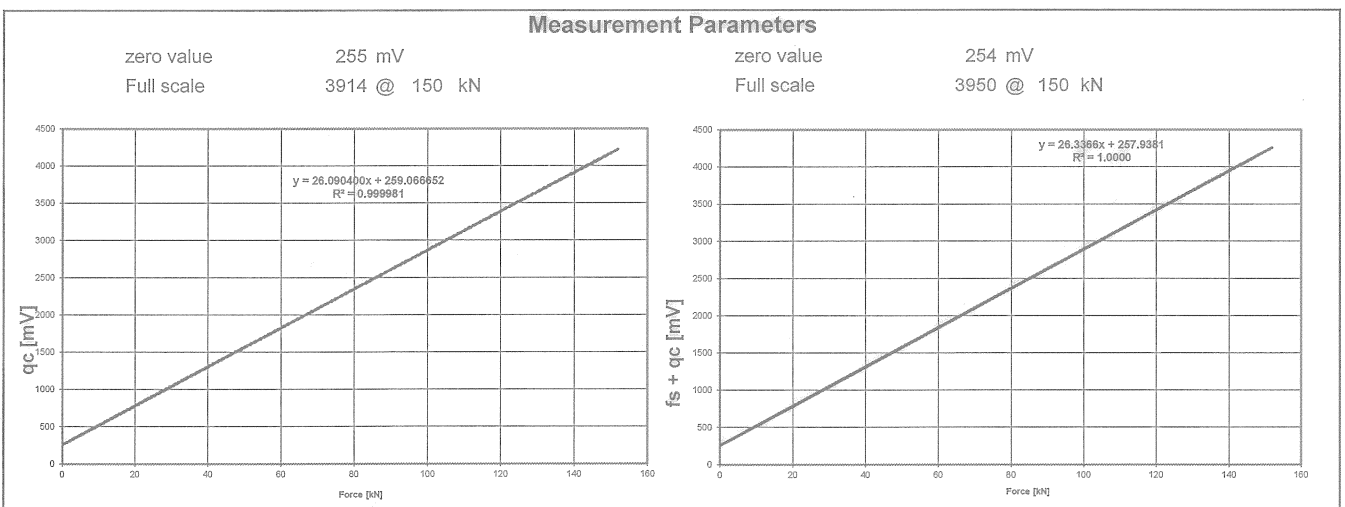
Certificate No. CMI 22.11.5095

Instrument		Calibration Result: Calibrated to Earth
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 29-11-2022
Manufacturer:	Gouda Geo-Equipment B.V.	Next Due Date: 29-11-2023
Model No.:	DP15-CFPTxy	Location: Hillegom (The Netherlands)
Serial No.:	70169	
Cone area factor:	0,75	
Used Calibration Procedure:	GGCEP004, ISO22476	

Customer		Contact Info
Ground Investigation Ltd.		Tel: +31 (0)71 513 84 75
		E: info@gouda-geo.com
		I: www.gouda-geo.com

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 668966 + 695054
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 28 June, 2022	Date Calibrated: 28 June, 2022	Date Calibrated: 1 November, 2022
Next Due Date: 28 December, 2022	Next Due Date: 28 December, 2022	Next Due Date: 1 November, 2023
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 22.06.4716	Traceability: CMI 22.06.4715	Traceability: 2211030065


Calibration Conditions	
Environmental conditions whilst performing the calibration:	Ambient Temperature: 22.2 °C
	Relative Humidity: 42.1 %
Condition of Calibrated Apparatus when Received: Fair	

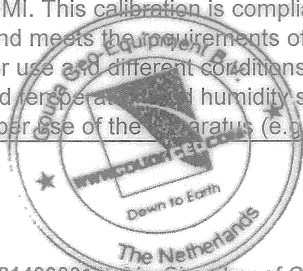


Remarks

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The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

BTW-nr./VAT-no. NL814930015 Chamber of Commerce (KvK) 28099363

Certificate of Calibration

Certificate No. CMI 22.11.5095

Instrument

Instrument Type: Electrical Subtraction Cone
Manufacturer: Gouda Geo-Equipment B.V.
Model No.: DP15-CFPTxy
Serial No.: 70169
Cone area factor: 0,75

Calibration Result: Certified

Date Calibrated: 29-11-2022
Next Due Date: 29-5-2023

Used Calibration Procedure: GGCEP004, ISO22476

Location: Hillegom (The Netherlands)

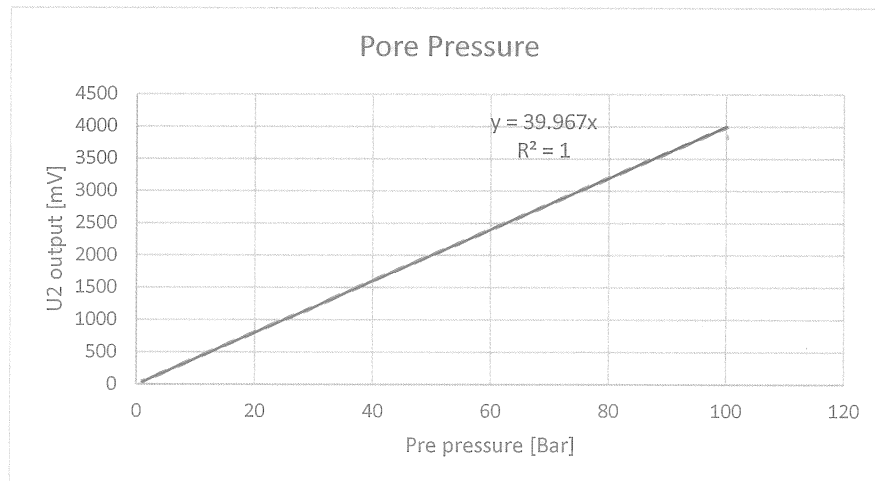
Calibration Instruments

Instrument Type: HP Kalibrator
Manufacturer: Keller Druckmesstechnik
Model No.: HPX - 200bar - 80139.31
Serial No.: 5208
Date Calibrated: 17 May, 2022
Next Due Date: 17 May, 2023
Calibrated By: Manufacturer

T +31 (0)71 513 8475
E info@gouda-geo.com
I www.gouda-geo.com

Pore pressure

AMB = +/-1Bar = 333 Mv	
U2 [bar]	U2 [mV]
1	38
5	198
10	399
15	603
20	801
25	1000
30	1195
35	1401
40	1602
45	1804
50	2003
55	2203
60	2401
65	2602
70	2799
75	2999
80	3197
85	3395
90	3594
95	3791
100	3990



Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

BTW-nr./VAT-no. NL814930072001 - Chamber of Commerce (KvK) 2809914

Certificate of Calibration

Certificate No. CMI 22.11.5095

Down to Earth

Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	
Manufacturer:	Gouda Geo-Equipment B.V.	
Model No.:	DP15-CFPTxy	Date Calibrated: 29-11-2022
Serial No.:	70169	Next Due Date: 29-5-2023
Cone area factor:	0,75	
Used Calibration Procedure:	GGÉCP004, ISO22476	Location: Hillegom (The Netherlands)

Inclinometer

T +31 (0)71 513 84 75
E info@gouda-geo.com
I www.gouda-geo.com

Degrees	Ix [mV]	Degrees	Iy [mV]
20	3008	20	3320
19	2969	19	3272
18	2925	18	3228
17	2881	17	3179
16	2842	16	3140
15	2798	15	3096
14	2764	14	3052
13	2715	13	3003
12	2672	12	2954
11	2627	11	2911
10	2584	10	2862
9	2535	9	2818
8	2491	8	2774
7	2457	7	2730
6	2408	6	2676
5	2364	5	2632
4	2316	4	2579
3	2276	3	2535
2	2222	2	2486
1	2183	1	2442
0	2150	0	2398
-1	2101	-1	2339
-2	2061	-2	2301
-3	2012	-3	2247
-4	1969	-4	2198
-5	1920	-5	2158
-6	1881	-6	2110
-7	1842	-7	2066
-8	1798	-8	2013
-9	1754	-9	1969
-10	1710	-10	1915
-11	1666	-11	1871
-12	1617	-12	1832
-13	1578	-13	1788
-14	1539	-14	1739
-15	1505	-15	1695
-16	1456	-16	1647
-17	1412	-17	1598
-18	1373	-18	1554
-19	1324	-19	1510
-20	1285	-20	1471

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

BTW-nr./VAT-no. NL814930013B01 - Chamber of Commerce (KvK) 16033015

Certificate of Calibration

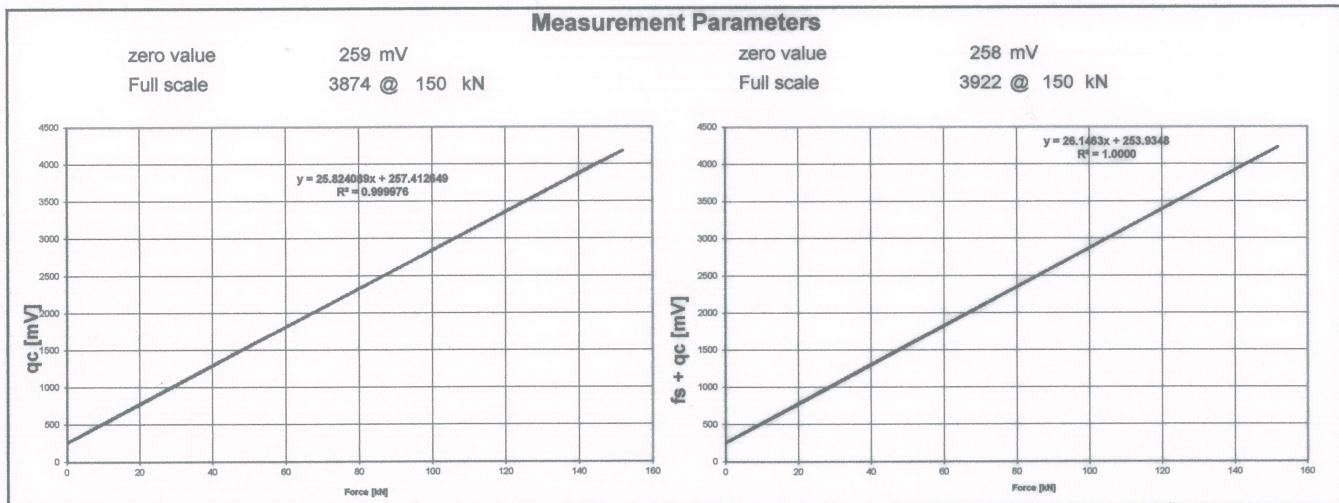
Certificate No. CMI 22.11.5028

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V	Date Calibrated: 4-11-2022
Model No.:	DP15-CFPTxy	Next Due Date: 4-5-2023
Serial No.:	71062	
Cone area factor:	0,75	
Used Calibration Procedure:	GGCEP004, ISO22476	Location: Hillegom (The Netherlands)

Customer
Ground Investigations Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 1016780 + 1013883
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 28 June, 2022	Date Calibrated: 28 June, 2022	Date Calibrated: 24 March, 2022
Next Due Date: 28 December, 2022	Next Due Date: 28 December, 2022	Next Due Date: 24 March, 2023
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 22.06.4716	Traceability: CMI 22.06.4715	Traceability: 2203240009

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Tempera:	18.8 °C
	Relative Humidity:	52.7 %
Condition of Calibrated Apparatus when Received: Fair		



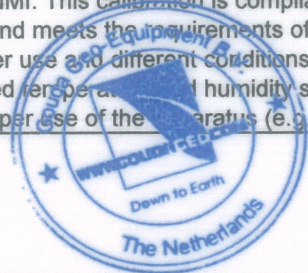
Remarks

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The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijn
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.11.5028

Instrument

Instrument Type: Electrical Subtraction Cone
Manufacturer: Gouda Geo-Equipment B.V.
Model No.: DP15-CFPTxy
Serial No.: 71062
Cone area factor: 0,75

Calibration Result: Certified

Date Calibrated: 4-11-2022
Next Due Date: 4-5-2023

Used Calibration Procedure: GGECP004, ISO22476

Location: Hillegom (The Netherlands)

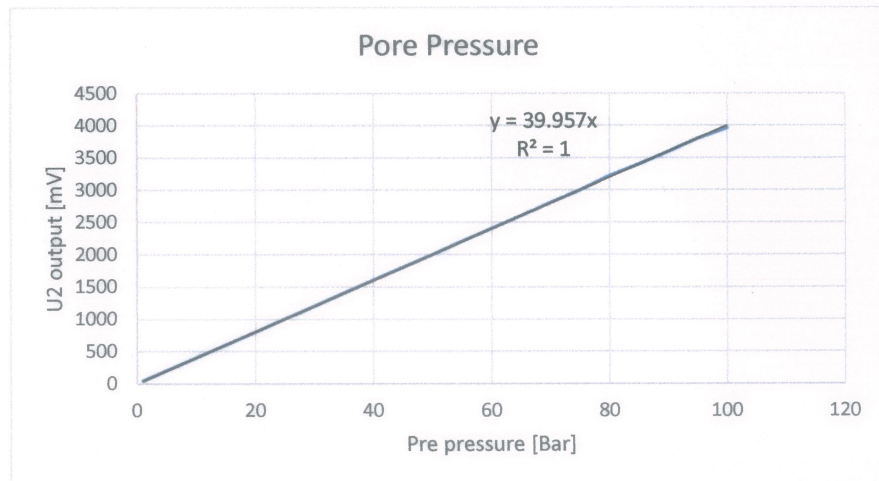
Calibration Instruments

Instrument Type: HP Kalibrator
Manufacturer: Keller Druckmesstechnik
Model No.: HPX - 200bar - 80139.31
Serial No.: 5208
Date Calibrated: 17 May, 2022
Next Due Date: 17 May, 2023
Calibrated By: Manufacturer

Pore pressure

AMB = +/-1Bar = 304 Mv

U2 [bar]	U2 [mV]
1	43
5	198
10	400
15	601
20	801
25	1002
30	1200
35	1405
40	1604
45	1801
50	2000
55	2204
60	2402
65	2601
70	2803
75	3000
80	3212
85	3398
90	3595
95	3796
100	3958



Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.11.5028

Instrument

Instrument Type: Electrical Subtraction Cone
Manufacturer: Gouda Geo-Equipment B.V.
Model No.: DP15-CFPTxy
Serial No.: 71062
Cone area factor: 0,75

Calibration Result: Certified

Date Calibrated: 4-11-2022
Next Due Date: 4-5-2023

Used Calibration Procedure: GGECP004, ISO22476

Location: Hillegom (The Netherlands)

Inclinometer

Degrees	Ix [mV]
20	3042
19	3003
18	2954
17	2915
16	2867
15	2827
14	2793
13	2749
12	2710
11	2657
10	2623
9	2569
8	2525
7	2481
6	2442
5	2398
4	2354
3	2310
2	2262
1	2223
0	2178
-1	2144
-2	2096
-3	2052
-4	2008
-5	1959
-6	1915
-7	1871
-8	1842
-9	1793
-10	1749
-11	1705
-12	1661
-13	1617
-14	1574
-15	1539
-16	1495
-17	1456
-18	1408
-19	1369
-20	1325

Degrees	Iy [mV]
20	3413
19	3364
18	3325
17	3271
16	3232
15	3178
14	3134
13	3100
12	3052
11	3002
10	2954
9	2910
8	2856
7	2817
6	2773
5	2729
4	2675
3	2631
2	2583
1	2529
0	2490
-1	2441
-2	2401
-3	2344
-4	2299
-5	2251
-6	2202
-7	2168
-8	2119
-9	2076
-10	2017
-11	1978
-12	1924
-13	1881
-14	1846
-15	1802
-16	1753
-17	1704
-18	1666
-19	1612
-20	1573

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

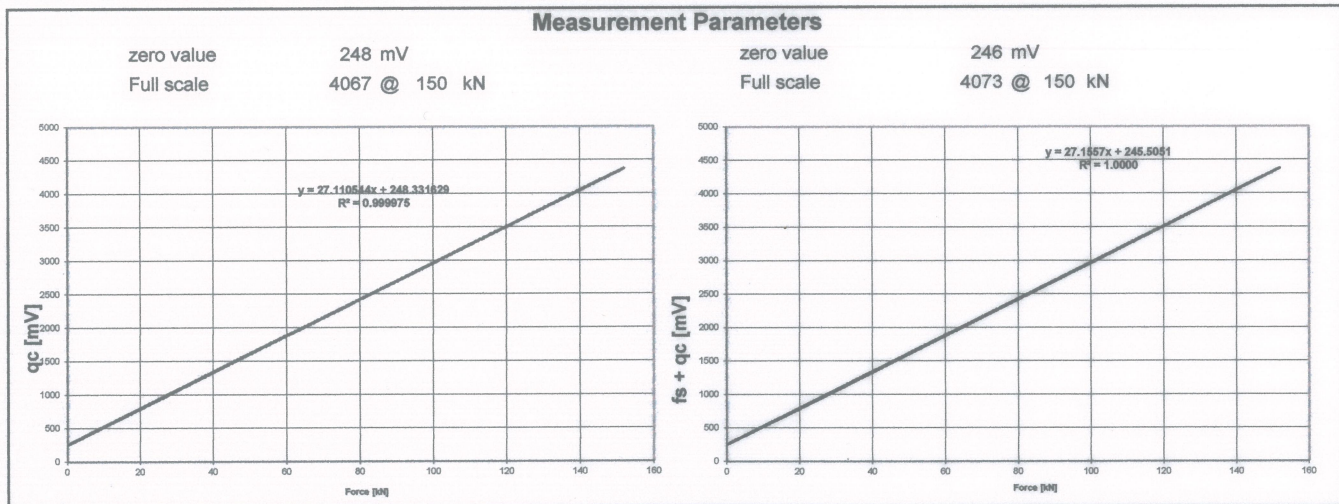
Certificate No. CMI 22.10.4976

Instrument		
Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified
Manufacturer:	Gouda Geo-Equipment B.V.	Date Calibrated: 7-10-2022
Model No.:	DP15-CFPTxy	Next Due Date: 7-4-2023
Serial No.:	71137	
Cone area factor:	0,75	
Used Calibration Procedure:	GGCEP004, ISO22476	Location: Hillegom (The Netherlands)

Customer
Ground Investigations Ltd.

Calibration Instruments		
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 1016780 + 1013883
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 28 June, 2022	Date Calibrated: 28 June, 2022	Date Calibrated: 24 March, 2022
Next Due Date: 28 December, 2022	Next Due Date: 28 December, 2022	Next Due Date: 24 March, 2023
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 22.06.4716	Traceability: CMI 22.06.4715	Traceability: 2203240009

Calibration Conditions		
Environmental conditions whilst performing the calibration:	Ambient Tempera:	20.1 °C
	Relative Humidity:	47.1 %
Condition of Calibrated Apparatus when Received: Fair		



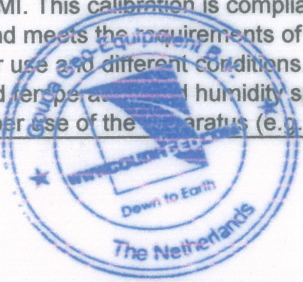
Remarks

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Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijn
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.10.4976

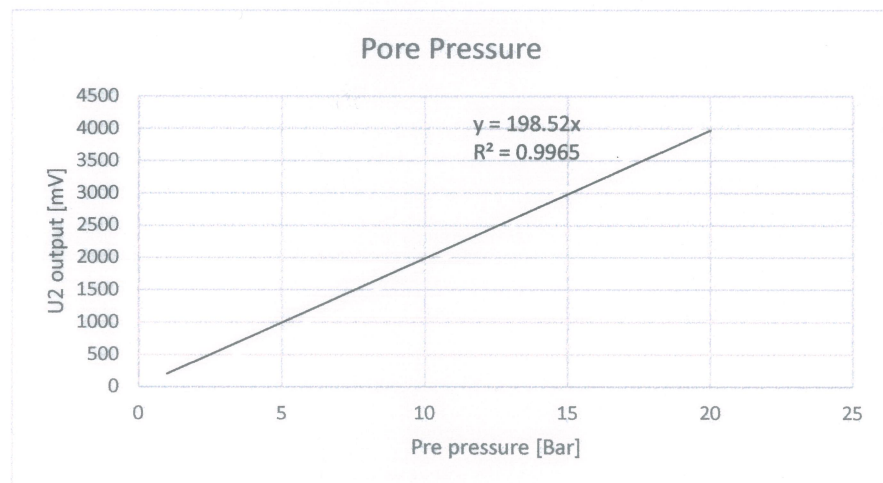
Instrument		Calibration Result: Certified
Instrument Type:	Electrical Subtraction Cone	Date Calibrated: 7-10-2022
Manufacturer:	Gouda Geo-Equipment B.V.	Next Due Date: 7-4-2023
Model No.:	DP15-CFPTxy	
Serial No.:	71137	
Cone area factor:	0,75	
Used Calibration Procedure: GGCEP004, ISO22476		Location: Hillegom (The Netherlands)

Calibration Instruments	
Instrument Type:	HP Kalibrator
Manufacturer:	Keller Druckmesstechnik
Model No.:	HPX - 200bar - 80139.31
Serial No.:	5208
Date Calibrated:	17 May, 2022
Next Due Date:	17 May, 2023
Calibrated By:	Manufacturer

Pore pressure

AMB = +/-1Bar = 302 Mv

U2 [bar]	U2 [mV]
1	40
2	204
3	413
4	616
5	821
6	1027
7	1233
8	1438
9	1648
10	1847
11	2056
12	2256
13	2464
14	2873
15	3078
16	3276
17	3487
18	3688
19	3889
20	4091



Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

Certificate of Calibration

Certificate No. CMI 22.10.4976

Instrument

Instrument Type: Electrical Subtraction Cone
Manufacturer: Gouda Geo-Equipment B.V.
Model No.: DP15-CFPTxy
Serial No.: 71137
Cone area factor: 0,75

Calibration Result: Certified

Date Calibrated: 7-10-2022
Next Due Date: 7-4-2023

Used Calibration Procedure: GGECP004, ISO22476

Location: Hillegom (The Netherlands)

Inclinometer

Degrees	Ix [mV]
20	3096
19	3057
18	3007
17	2964
16	2925
15	2876
14	2837
13	2793
12	2759
11	2710
10	2666
9	2617
8	2573
7	2530
6	2486
5	2447
4	2398
3	2359
2	2305
1	2266
0	2217
-1	2178
-2	2140
-3	2096
-4	2051
-5	2003
-6	1959
-7	1910
-8	1871
-9	1837
-10	1793
-11	1749
-12	1700
-13	1661
-14	1612
-15	1578
-16	1534
-17	1495
-18	1451
-19	1407
-20	1368

Degrees	Iy [mV]
20	3427
19	3387
18	3339
17	3295
16	3251
15	3197
14	3159
13	3110
12	3075
11	3021
10	2978
9	2929
8	2880
7	2836
6	2792
5	2753
4	2699
3	2651
2	2602
1	2553
0	2504
-1	2465
-2	2422
-3	2368
-4	2324
-5	2270
-6	2227
-7	2182
-8	2143
-9	2095
-10	2041
-11	2002
-12	1948
-13	1904
-14	1860
-15	1821
-16	1772
-17	1729
-18	1680
-19	1631
-20	1592

Calibration performed by:

Vincent Vermeer
(Engineer)



Approved by:

Rogier Tijm
(Senior Engineer)

CONE CALIBRATION CERTIFICATE

N° Z189/21

Calibrated system (Sistema tarato) :

Serial number	Mks300
Sensor	TIP RESISTANCE
Max. Capacity [MPa]:	50
Scaling Factor:	191940
Tip net area ratio (a _n):	0,79
Sleeve net ratio (b _n):	0,00

Addressee (destinatario) :

Ground Investigation - PO Box 180165
Luckens Point West Harbour
Auckland 0663 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495

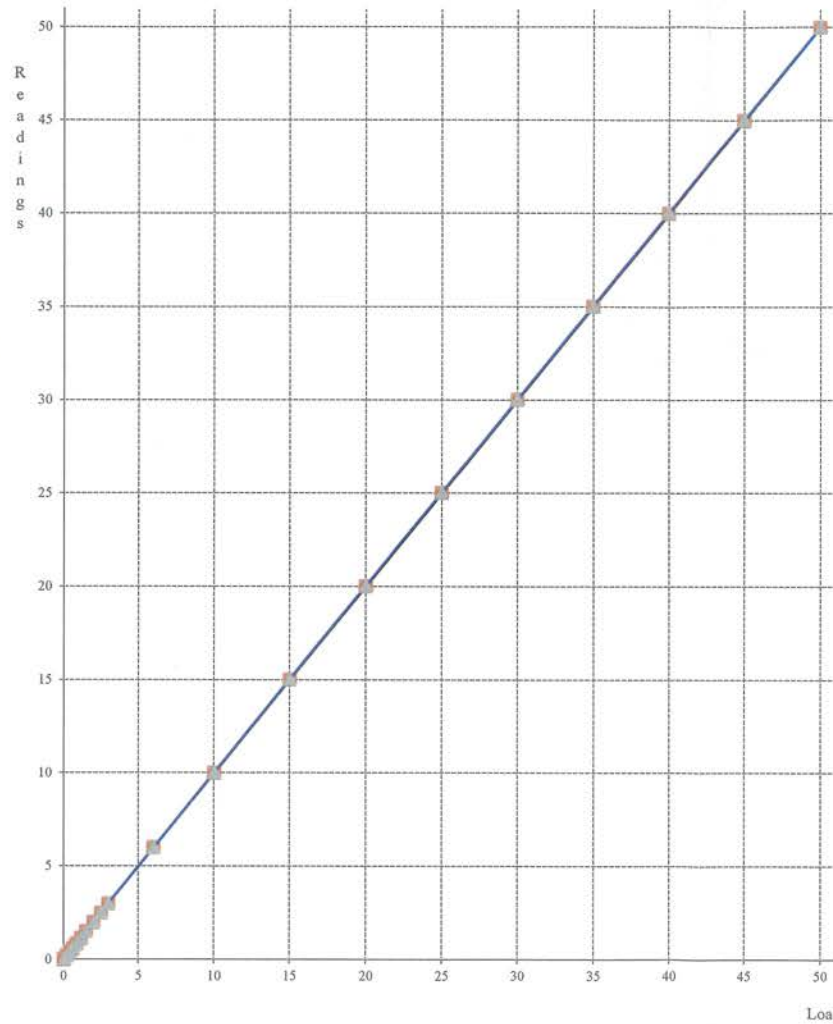
Power press:

Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	22/01/2021
Certificate N.	LAT 091 2021-019
Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with ASTM D5778-12



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	-0,01
2	0,03	0,03	0,03	0,03
3	0,20	0,20	0,20	0,20
4	0,40	0,39	0,40	0,40
5	0,60	0,59	0,60	0,60
6	0,85	0,83	0,85	0,85
7	1,15	1,14	1,15	1,15
8	1,50	1,49	1,50	1,50
9	2,00	1,99	2,00	2,00
10	2,50	2,49	2,50	2,50
11	3,00	2,99	3,00	3,00
12	6,00	6,00	6,00	6,01
13	10,00	10,01	10,00	10,03
14	15,00	15,02	15,00	15,04
15	20,00	20,03	20,00	20,05
16	25,00	25,03	25,00	25,06
17	30,00	30,04	30,00	30,06
18	35,00	35,03	35,00	35,05
19	40,00	40,02	40,00	40,05
20	45,00	45,01	45,00	45,04
21	50,00	50,00	50,00	50,00

Unit: Mpa

Zero-load error:	=	0,010	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,070	% FSO
Hysteresis:	=	0,052	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,042	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 02/08/2021

CONE CALIBRATION CERTIFICATE

N° Z189/21

Calibrated system (Sistema tarato) :

Serial number **Mks300**
Sensor **SLEEVE FRICTION**
Max. Capacity [kPa]: **1600**
Scaling Factor: **30740**

Addressee (destinatario) :

Ground Investigation - PO Box 180165
Luckens Point West Harbour
Auckland 0663 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer **AEP transducers**
Model **KAL 50 kN**
Serial Number **65495**

Power press:

Manufacturer **Easydur Italiana**
Model **Aura 10T**
Serial Number **29002**

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

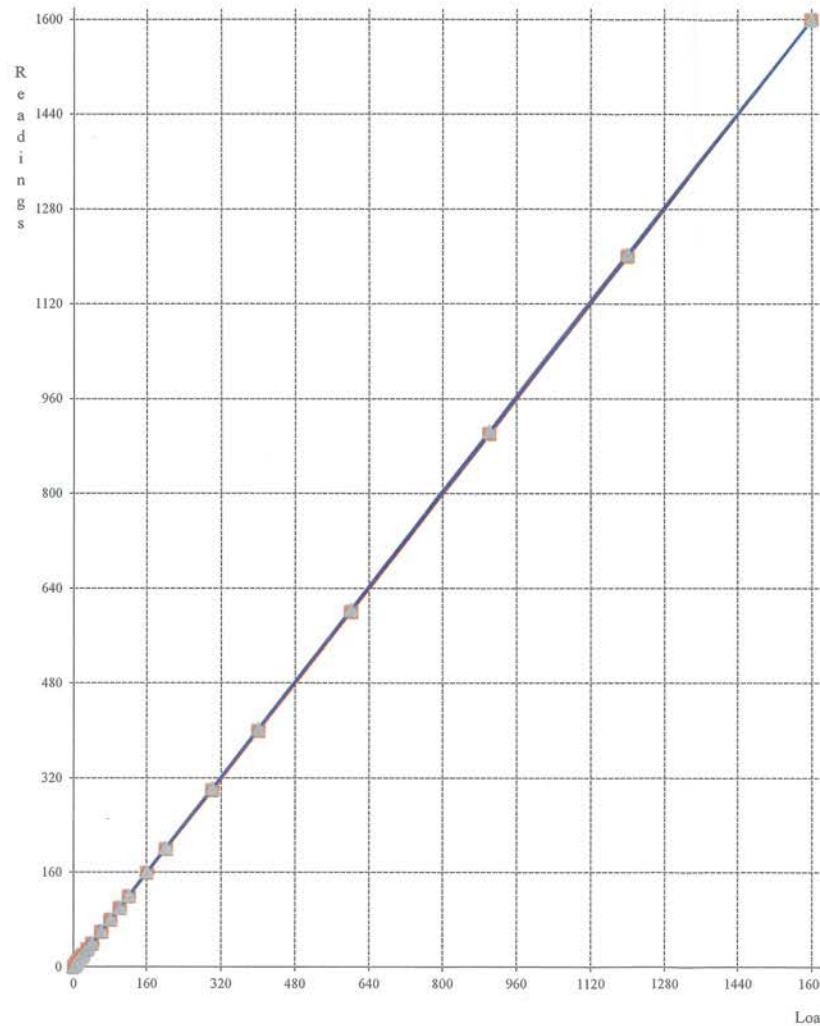
Last verification date: **22/01/2021**

Certificate N. **LAT 091 2021-019**

Temperature of calibration **22°C**

Humidity **45%**

Factory calibration in accordance with **ASTM D5778-12**



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,40
2	2,00	2,00	2,00	2,47
3	5,00	5,00	5,00	5,47
4	7,00	6,93	7,00	7,53
5	10,00	10,00	10,00	10,67
6	16,00	15,87	16,00	16,60
7	20,00	19,87	20,00	20,67
8	30,00	29,87	30,00	30,80
9	40,00	39,73	40,00	40,80
10	60,00	59,67	60,00	60,93
11	80,00	79,67	80,00	81,07
12	100,00	99,67	100,00	101,20
13	120,00	119,60	120,00	121,33
14	160,00	159,60	160,00	161,67
15	200,00	199,67	200,00	202,00
16	300,00	299,87	300,00	302,80
17	400,00	399,93	400,00	403,33
18	600,00	600,40	600,00	604,33
19	900,00	901,00	900,00	905,27
20	1200,00	1201,07	1200,00	1204,80
21	1600,00	1600,00	1600,00	1600,27

Unit: kPa

Zero-load error:	=	0,025	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,067	% FSO
Hysteresis:	=	0,267	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,089	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue **02/08/2021**

CONE CALIBRATION CERTIFICATE

N° Z189/21

Calibrated system (Sistema tarato) :

Serial number	Mks300
Sensor	PORE PRESSURE
Max. Capacity [kPa]:	2500
Scaling Factor:	11024
Sensor	TILT ANGLE
Max. Inclination [°]:	20
Scaling Factor:	277277

Addressee (destinatario) :

Ground Investigation - PO Box 180165
Luckens Point West Harbour
Auckland 0663 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

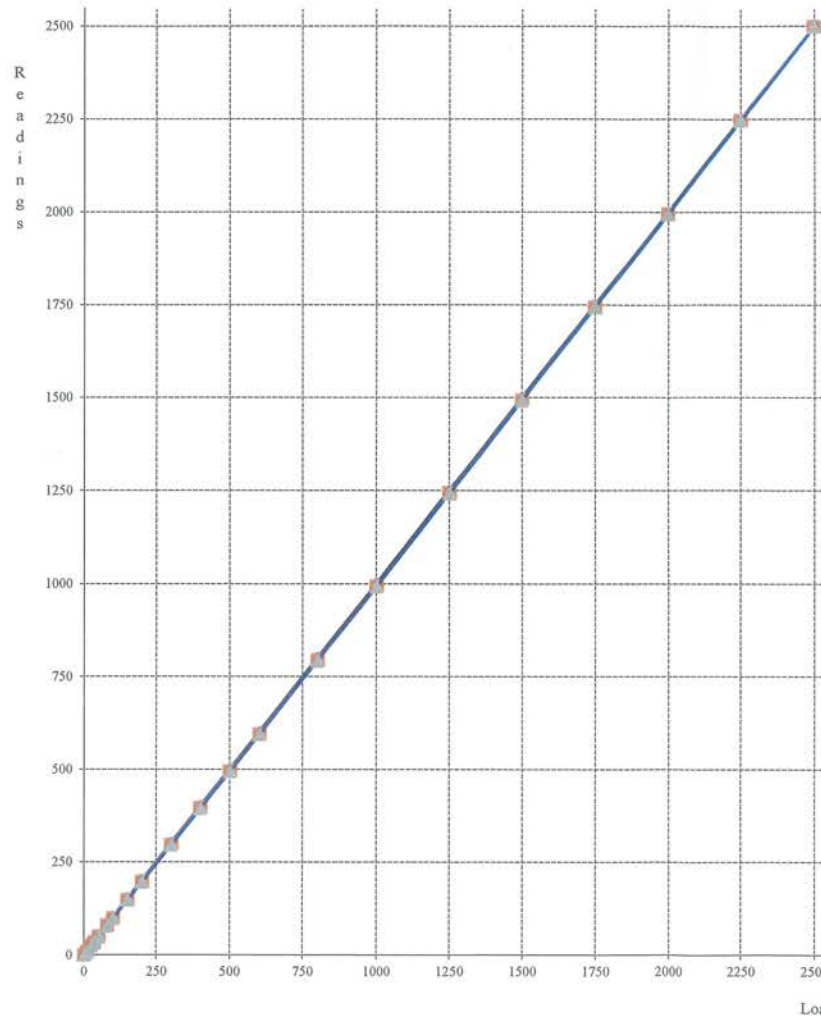
Pressure Generator:

Manufacturer	MENSOR
Model	CPC 4000
Serial Number	41000V56
Sensor Descr	Silicon Pressure Transducer
Sensor Serial Number	41000SYF

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	04/05/2021
Certificate N.	0288-SP-21
Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,10	0,00	0,10	0,10
2	10,00	9,90	9,80	9,70
3	25,00	24,90	25,00	24,80
4	35,00	34,70	35,00	34,70
5	50,00	49,70	50,00	49,50
6	80,00	79,40	80,00	79,00
7	100,00	99,10	100,00	98,70
8	150,00	148,30	150,00	148,00
9	200,00	197,80	199,80	197,40
10	300,10	296,90	300,00	296,50
11	400,00	396,00	400,00	395,80
12	500,00	495,50	500,00	495,10
13	600,00	594,80	600,00	594,40
14	800,00	794,00	800,00	793,50
15	1000,00	993,50	1000,00	993,10
16	1250,00	1243,60	1250,00	1243,20
17	1500,00	1493,90	1500,00	1493,70
18	1750,00	1745,00	1750,00	1744,60
19	2000,00	1996,30	1999,90	1996,10
20	2250,00	2248,10	2249,90	2247,90
21	2500,00	2500,00	2500,00	2500,30

Unit: kPa

Zero-load error:	=	0,004	% FSO
Nonlinearity:	=	0,260	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 02/08/2021

CONE CALIBRATION CERTIFICATE

N° Z189/21

Calibrated system (Sistema tarato) :

Serial number	Mks300
Tip net area ratio (a _n):	0,7936
Sleeve net ratio (b _n):	0,0004

Addressee (destinatario) :

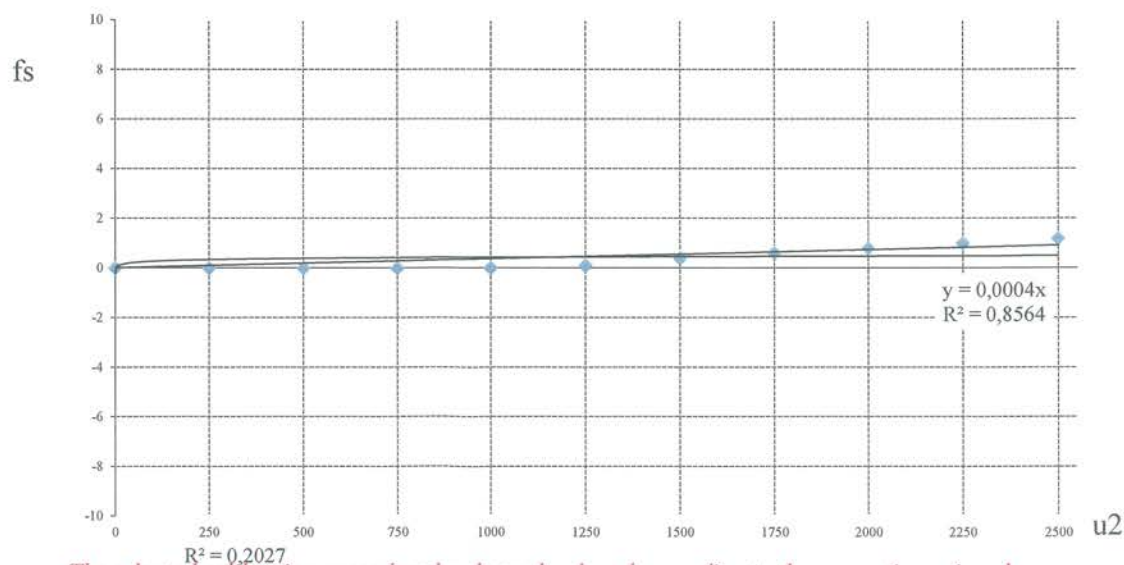
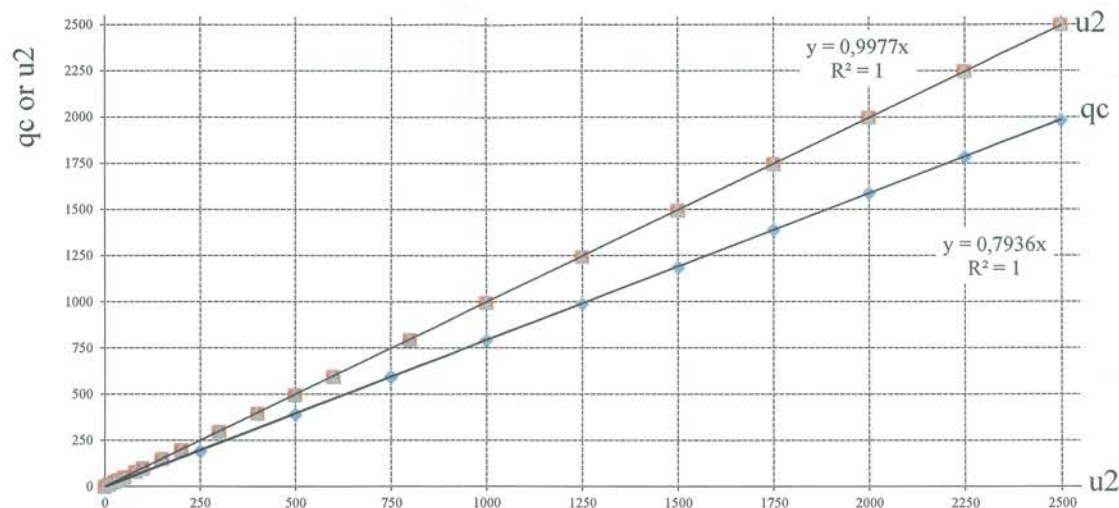
Ground Investigation - PO Box 180165
Luckens Point West Harbour
Auckland 0663 - (New Zealand)

	u ₂ (kPa)	q _c (kPa)	f _s (kPa)	u ₂ (psi)	q _c (psi)	f _s (psi)
0 (0)	0,10	0,00	0,00	0,00	0,00	0,00
250 (36,26)	250,20	193,00	0,00	247,20	27,99	0,00
500 (72,52)	500,00	391,00	0,00	495,10	56,71	0,00
750 (108,78)	750,00	594,00	0,00	743,90	86,15	0,00
1000 (145,04)	1000,00	792,00	0,00	993,20	114,87	0,00
1250 (181,30)	1250,00	990,00	0,10	1243,20	143,59	0,01
1500 (217,56)	1500,00	1188,00	0,40	1493,70	172,30	0,06
1750 (253,82)	1750,00	1391,00	0,60	1744,60	201,75	0,09
2000 (290,08)	2000,00	1589,00	0,80	1996,10	230,46	0,12
2250 (326,33)	2250,00	1787,00	1,00	2247,70	259,18	0,15
2500 (362,59)	2500,00	1985,00	1,20	2499,70	287,90	0,17

Unit: kPa - (psi)

Temperature of calibration 22°C
Humidity 45%

Factory calibration in accordance with *ASTM D5778-12*



The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue

02/08/2021

CONE CALIBRATION CERTIFICATE

N° Z189/21

Calibrated system (Sistema tarato) :

Serial number Mks300
 Sensor TEMPERATURE
 Max. Temperature [°C]: 50
 Scaling Factor: 437851

Addressee (destinatario) :

Ground Investigation - PO Box 180165
 Luckens Point West Harbour
 Auckland 0663 - (New Zealand)

Psychrometric system:

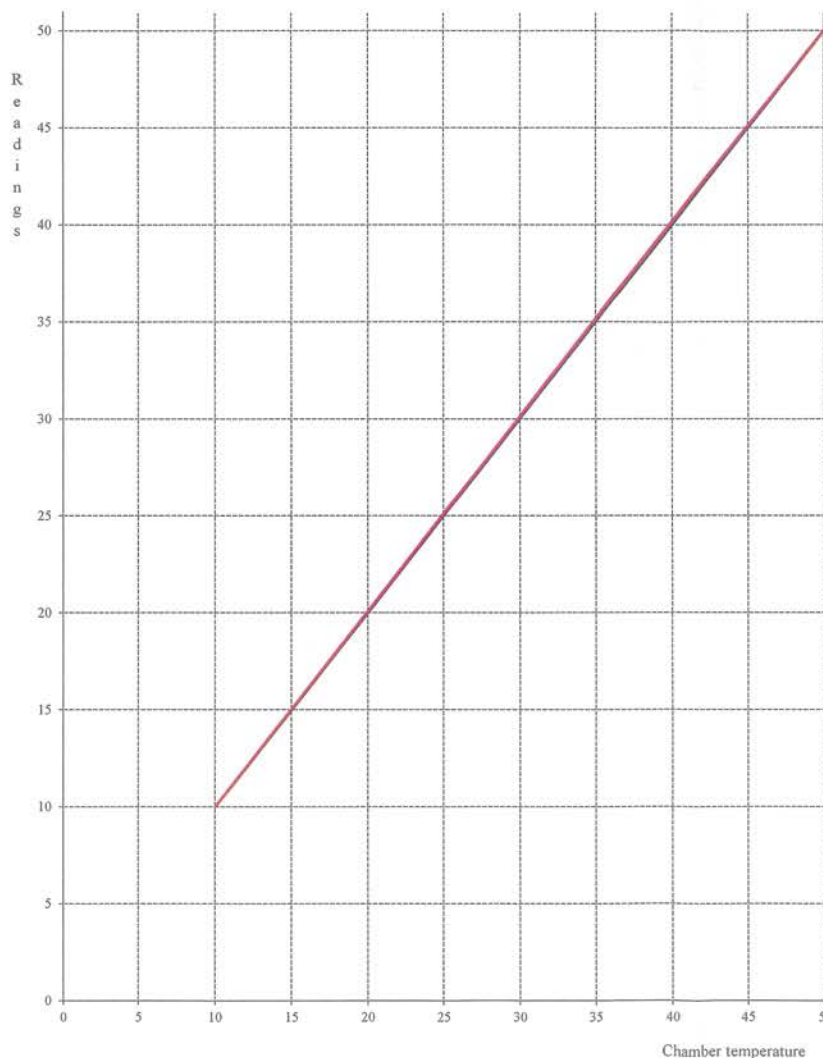
(Sistema psicrometrico)

Manufacturer ATT Angelantoni
 Model DY340
 Serial Number TT00210

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: 03/04/2013
 Certificate N. 021/13

Temperature of calibration
 Humidity 52%



	Ch temp	Readings
1	10,00	10,00
2	20,00	20,08
3	30,00	30,10
4	40,00	40,15
5	50,00	50,00

Unit: °C

Cone calibrated by 

Date of issue 02/08/2021

CONE CALIBRATION CERTIFICATE

N° Z129/21

Calibrated system (Sistema tarato) :

Serial number	Mks865
Sensor	TIP RESISTANCE
Max. Capacity [MPa]:	50
Scaling Factor:	180260
Tip net area ratio (a_n):	0,79
Sleeve net ratio (b_n):	0,00

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495

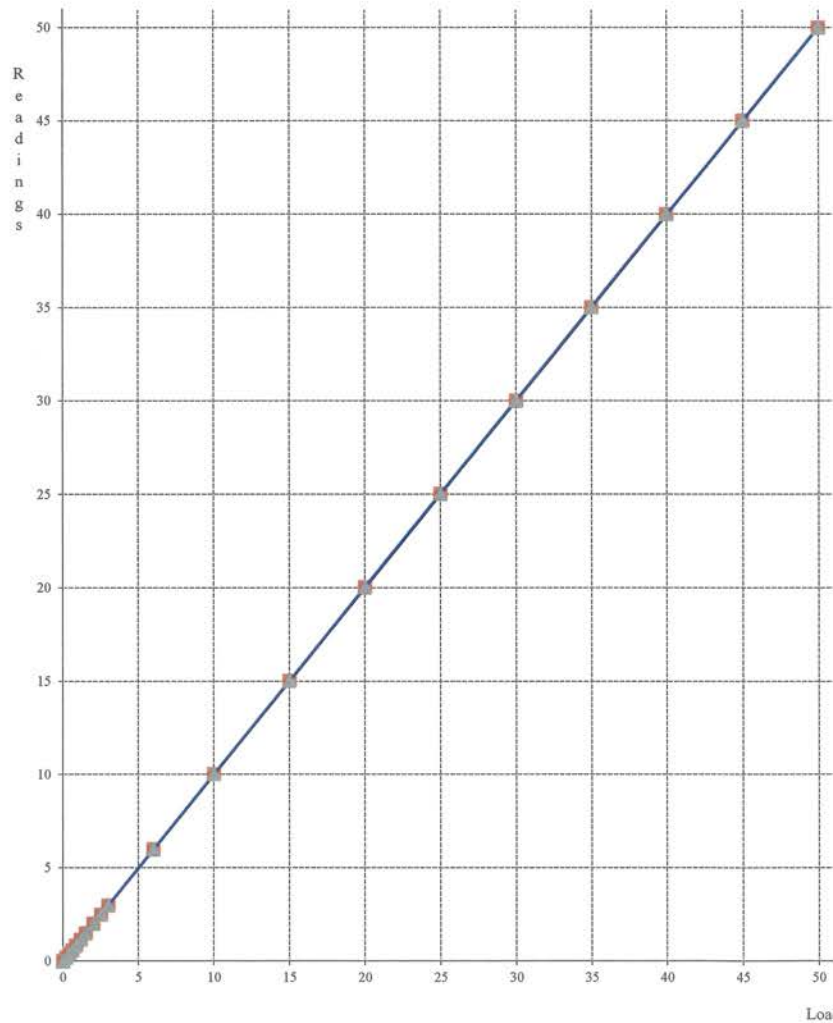
Power press:

Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	22/01/2021
Certificate N.	LAT 091 2021-019
Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*




	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	0,03	0,03	0,03	0,03
3	0,20	0,19	0,20	0,20
4	0,40	0,40	0,40	0,39
5	0,60	0,59	0,60	0,60
6	0,85	0,84	0,85	0,85
7	1,15	1,15	1,15	1,15
8	1,50	1,50	1,50	1,50
9	2,00	2,00	2,00	2,00
10	2,50	2,50	2,50	2,50
11	3,00	3,00	3,00	3,00
12	6,00	6,00	6,00	6,01
13	10,00	10,02	10,00	10,02
14	15,00	15,03	15,00	15,03
15	20,00	20,03	20,00	20,04
16	25,00	25,04	25,00	25,05
17	30,00	30,03	30,00	30,05
18	35,00	35,03	35,00	35,04
19	40,00	40,02	40,00	40,03
20	45,00	45,01	45,00	45,02
21	50,00	50,00	50,00	50,00

Unit: Mpa

Zero-load error:	=	0,000	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,072	% FSO
Hysteresis:	=	0,024	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,022	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE N° Z129/21

Calibrated system (Sistema tarato) :

Serial number	Mks865
Sensor	SLEEVE FRICTION
Max. Capacity [kPa]:	1600
Scaling Factor:	31602

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

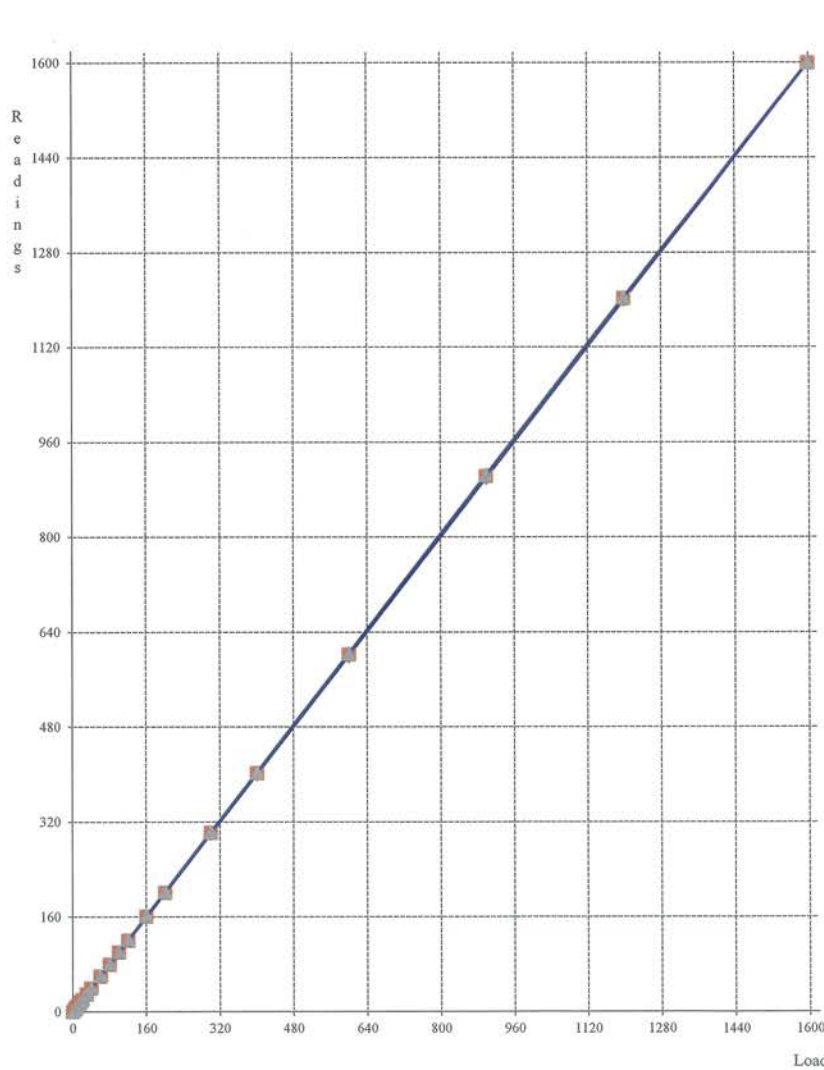
Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495
Power press:	
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	22/01/2021
Certificate N.	LAT 091 2021-019
Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,13
2	2,00	1,87	2,00	2,07
3	5,00	4,67	5,00	5,00
4	7,00	6,60	7,00	7,00
5	10,00	9,60	10,00	10,07
6	16,00	15,53	16,00	16,07
7	20,00	19,53	20,00	20,13
8	30,00	29,60	30,00	30,27
9	40,00	39,60	40,00	40,33
10	60,00	59,67	60,00	60,53
11	80,00	79,80	80,00	80,67
12	100,00	99,87	100,00	100,87
13	120,00	120,00	120,00	121,07
14	160,00	160,40	160,00	161,47
15	200,00	200,73	200,00	201,93
16	300,00	301,53	300,00	302,93
17	400,00	402,13	400,00	403,60
18	600,00	603,00	600,00	604,67
19	900,00	903,47	900,00	905,33
20	1200,00	1202,67	1200,00	1204,40
21	1600,00	1600,00	1600,00	1600,33

Unit: kPa

Zero-load error:	=	0,008	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,217	% FSO
Hysteresis:	=	0,117	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,036	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE

N° Z129/21

Calibrated system (Sistema tarato) :

Serial number	Mks865
Sensor	PORE PRESSURE
Max. Capacity [kPa]:	2500
Scaling Factor:	10685
Sensor	TILT ANGLE
Max. Inclination [°]:	20
Scaling Factor:	279278

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

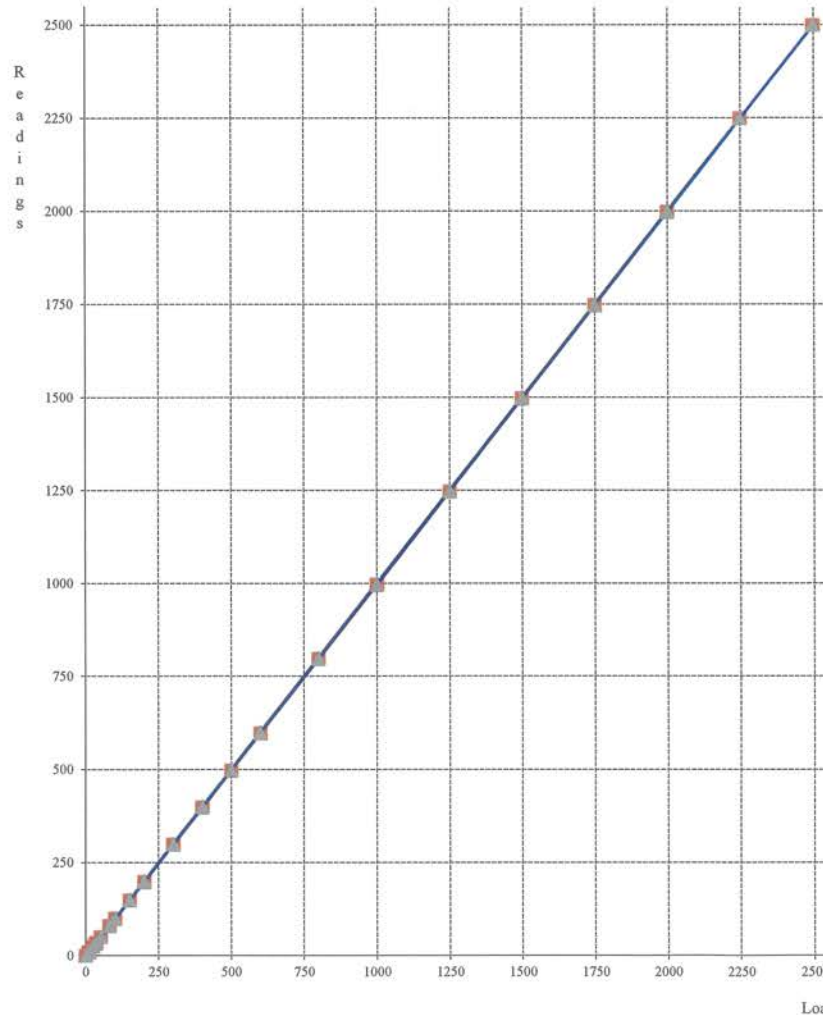
Pressure Generator:

Manufacturer	MENSOR
Model	CPC 4000
Serial Number	41000V56
Sensor Descr	Silicon Pressure Transducer
Sensor Serial Number	41000SYF

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	04/05/2021
Certificate N.	0288-SP-21
Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,10	0,00
2	10,00	9,80	10,00	9,80
3	25,00	24,80	25,00	24,80
4	35,00	34,70	35,00	34,80
5	50,00	49,60	50,00	49,80
6	80,00	79,50	80,00	79,70
7	100,00	99,40	100,00	99,70
8	150,00	149,20	150,00	149,60
9	200,00	199,10	199,90	199,50
10	300,00	298,70	300,00	299,50
11	400,00	398,50	400,00	399,40
12	500,00	498,40	500,00	499,40
13	600,00	598,30	599,90	599,20
14	800,00	797,90	800,00	799,10
15	1000,00	997,70	1000,00	999,00
16	1250,00	1247,50	1249,90	1248,60
17	1500,00	1497,80	1500,00	1498,70
18	1750,00	1747,90	1750,00	1748,90
19	2000,00	1998,60	1999,90	1999,10
20	2250,00	2249,40	2249,90	2249,70
21	2500,00	2500,00	2500,00	2500,10

Unit: kPa

Zero-load error:	=	0,004	% FSO
Nonlinearity:	=	0,100	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE
N° Z129/21

Calibrated system (Sistema tarato) :

Serial number	Mks865
Tip net area ratio (a _n):	0,7891
Sleeve net ratio (b _n):	0,0000

Addressee (destinatario) :

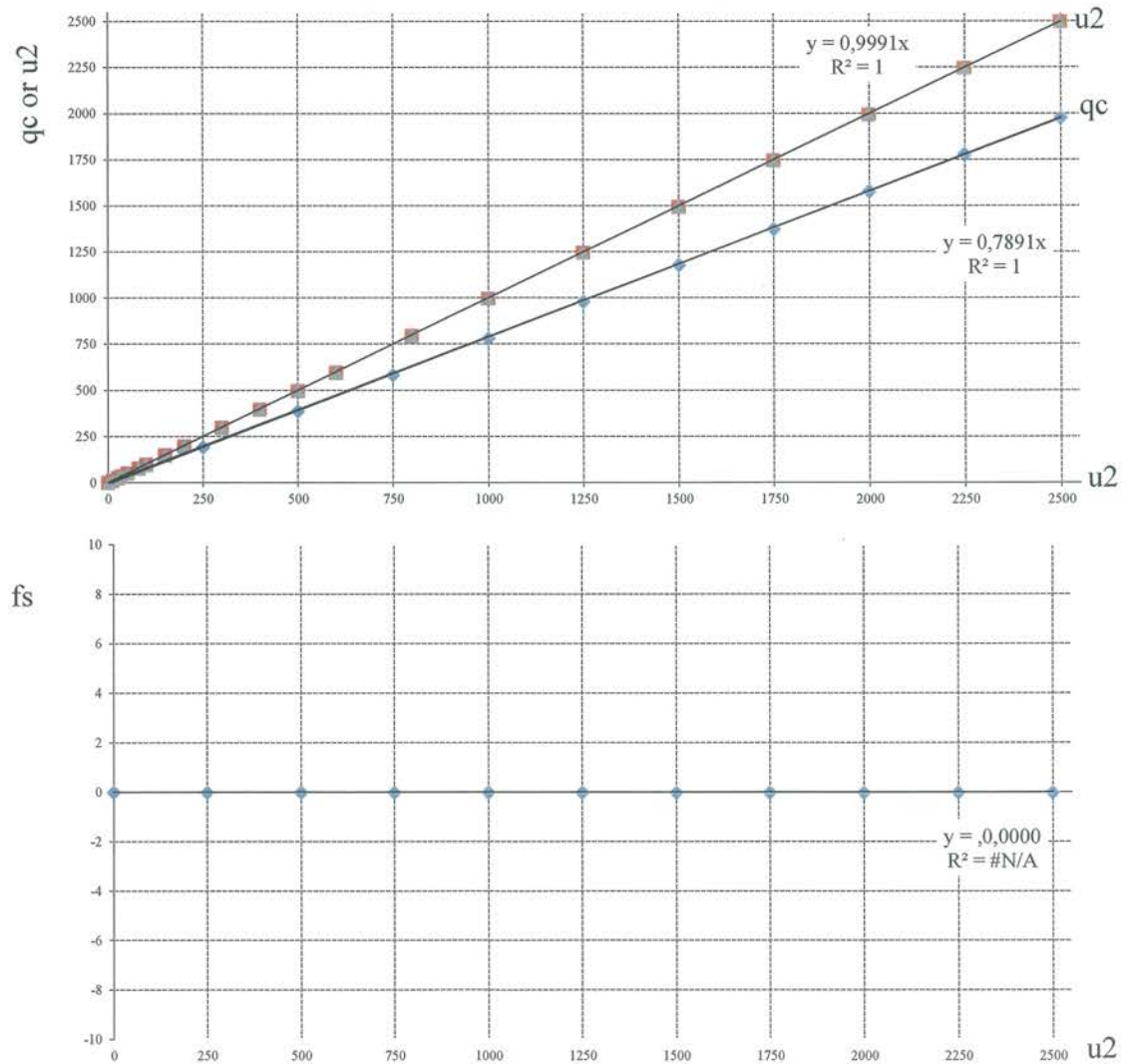
Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

	u2 (kPa)	qc (kPa)	fs (kPa)	u2 (psi)	qc (psi)	fs (psi)
0 (0)	0,00	0,00	0,00	0,00	0,00	0,00
250 (36,26)	250,00	194,00	0,00	249,30	28,14	0,00
500 (72,52)	500,00	388,00	0,00	498,80	56,27	0,00
750 (108,78)	750,00	582,00	0,00	748,30	84,41	0,00
1000 (145,04)	1000,00	782,00	0,00	998,10	113,42	0,00
1250 (181,30)	1250,00	982,00	0,00	1247,90	142,43	0,00
1500 (217,56)	1500,00	1182,00	0,00	1498,10	171,43	0,00
1750 (253,82)	1750,00	1376,00	0,00	1748,30	199,57	0,00
2000 (290,08)	2000,00	1581,00	0,00	1999,00	229,30	0,00
2250 (326,33)	2250,00	1781,00	0,00	2249,70	258,31	0,00
2500 (362,59)	2500,00	1980,00	0,00	2500,30	287,17	0,00

Unit: kPa - (psi)

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE
N° Z129/21

Calibrated system (Sistema tarato) :

Serial number Mks865
Sensor TEMPERATURE
Max. Temperature [°C]: 50
Scaling Factor: 424841

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Psychrometric system:

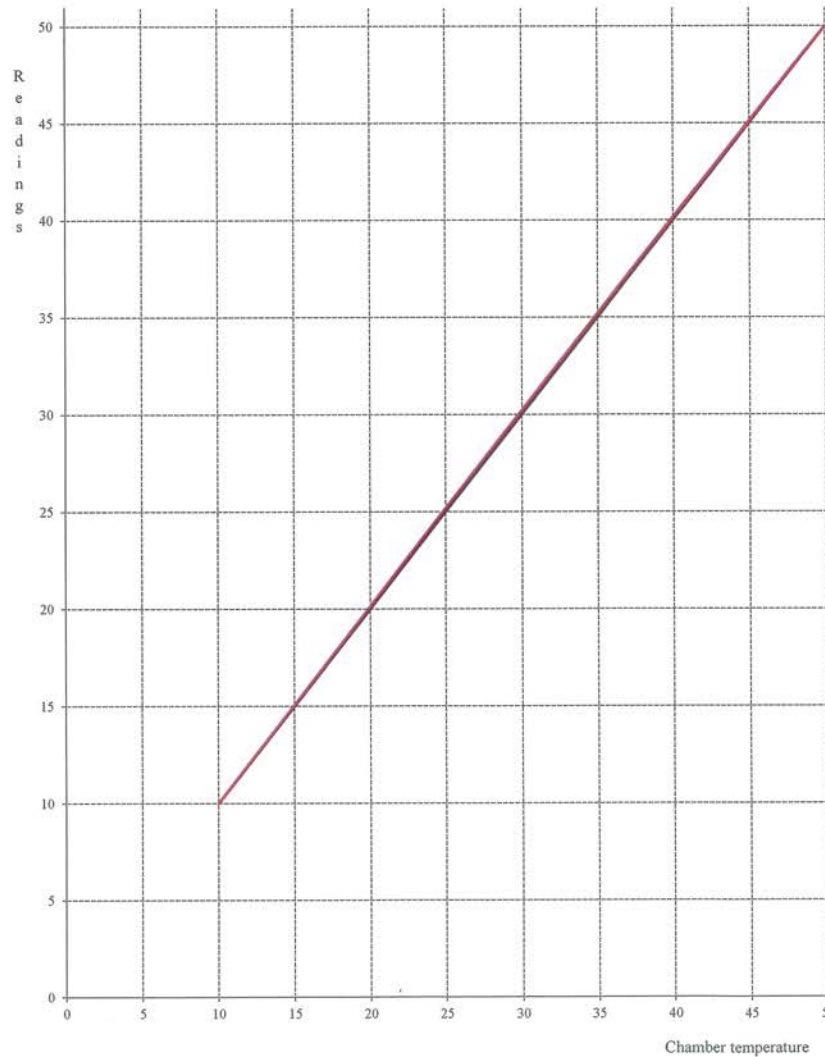
(Sistema psicrometrico)

Manufacturer ATT Angelantoni
Model DY340
Serial Number TT00210

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: 03/04/2013
Certificate N. 021/13

Temperature of calibration _____
Humidity 25%



	Ch temp	Readings
1	10,00	10,00
2	20,00	20,15
3	30,00	30,22
4	40,00	40,15
5	50,00	50,00

Unit: °C

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE

N° Z128/21

Calibrated system (Sistema tarato) :

Serial number	Mks866
Sensor	TIP RESISTANCE
Max. Capacity [MPa]:	50
Scaling Factor:	180340
Tip net area ratio (a_n):	0,79
Sleeve net ratio (b_n):	0,00

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 50 kN
Serial Number	65495

Power press:

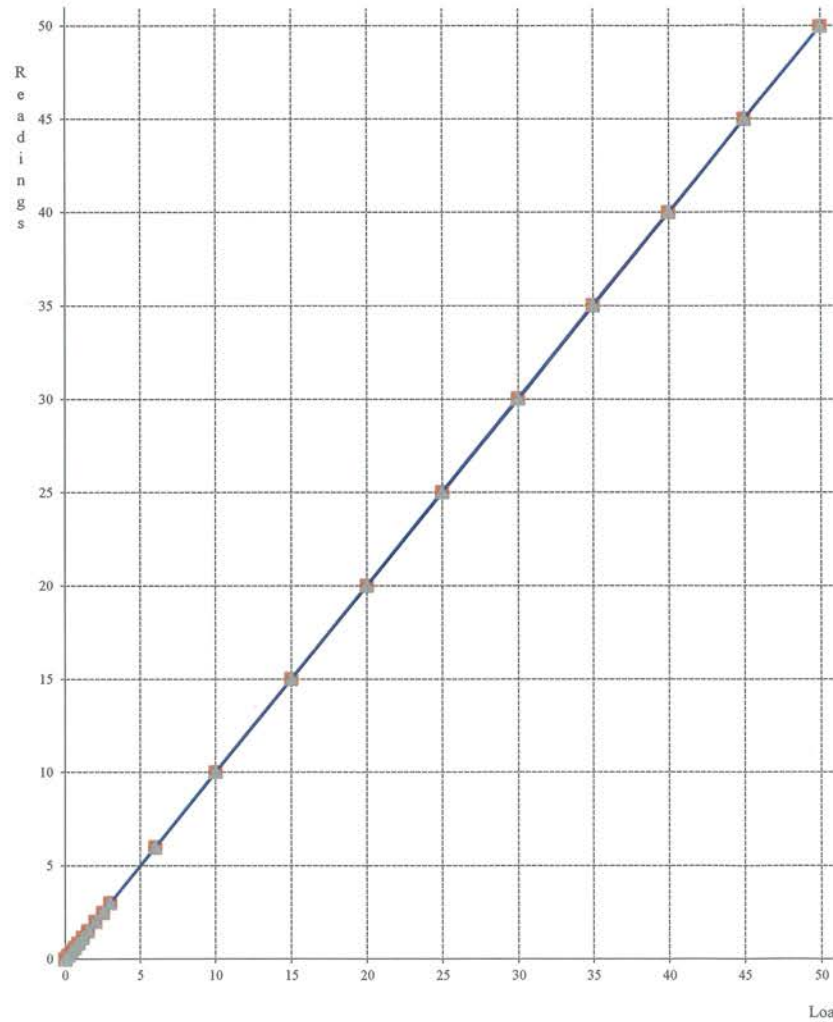
Manufacturer	Easydur Italiana
Model	Aura 10T
Serial Number	29002

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date:	22/01/2021
Certificate N.	LAT 091 2021-019

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,00
2	0,03	0,03	0,03	0,03
3	0,20	0,20	0,20	0,20
4	0,40	0,40	0,40	0,40
5	0,60	0,60	0,60	0,60
6	0,85	0,85	0,85	0,85
7	1,15	1,15	1,15	1,15
8	1,50	1,50	1,50	1,50
9	2,00	2,00	2,00	2,01
10	2,50	2,50	2,50	2,51
11	3,00	3,00	3,00	3,01
12	6,00	6,01	6,00	6,02
13	10,00	10,02	10,00	10,03
14	15,00	15,03	15,00	15,04
15	20,00	20,03	20,00	20,05
16	25,00	25,04	25,00	25,05
17	30,00	30,04	30,00	30,05
18	35,00	35,03	35,00	35,05
19	40,00	40,02	40,00	40,04
20	45,00	45,02	45,00	45,02
21	50,00	50,00	50,00	50,00

Unit: Mpa

Zero-load error:	=	0,000	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,076	% FSO
Hysteresis:	=	0,034	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,033	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE N° Z128/21

Calibrated system (Sistema tarato) :

Serial number **Mks866**
Sensor **SLEEVE FRICTION**
Max. Capacity [kPa]: **1600**
Scaling Factor: **29851**

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer **AEP transducers**
Model **KAL 50 kN**
Serial Number **65495**

Power press:

Manufacturer **Easydur Italiana**
Model **Aura 10T**
Serial Number **29002**

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

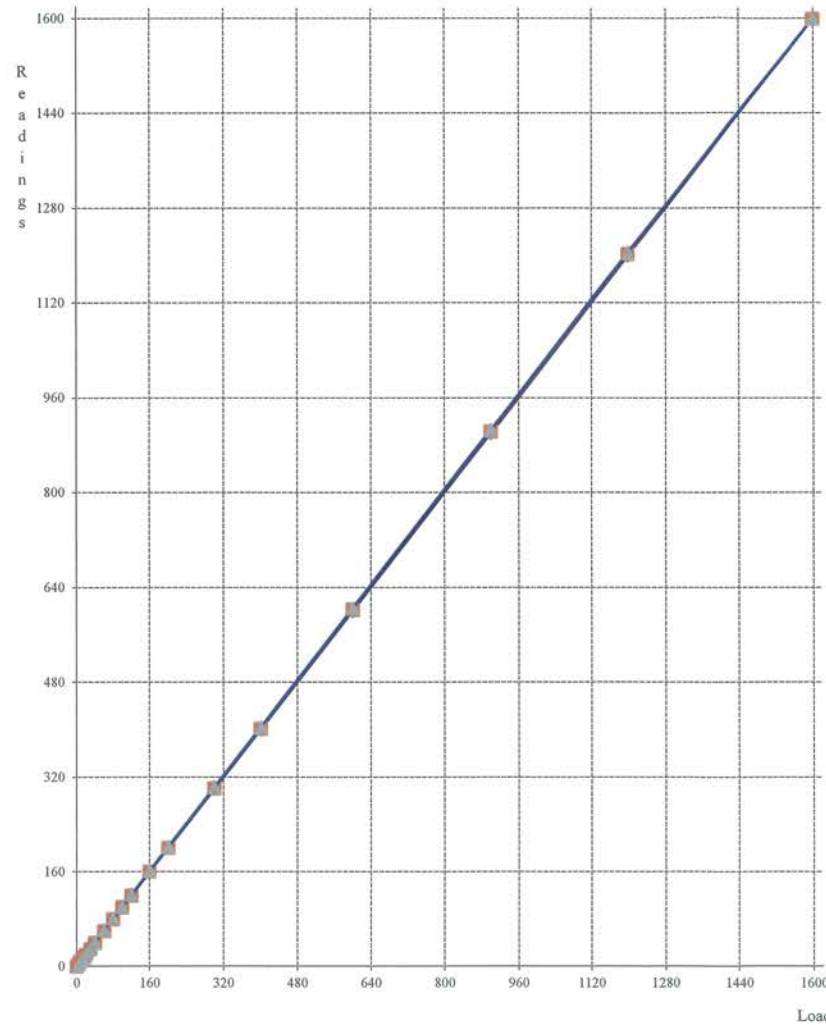
Last verification date: **22/01/2021**

Certificate N. **LAT 091 2021-019**

Temperature of calibration **22°C**

Humidity **45%**

Factory calibration in accordance with **ASTM D5778-12**



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,13
2	2,00	1,93	2,00	2,13
3	5,00	4,87	5,00	5,13
4	7,00	6,93	7,00	7,20
5	10,00	10,00	10,00	10,40
6	16,00	16,00	16,00	16,47
7	20,00	20,00	20,00	20,60
8	30,00	30,20	30,00	30,87
9	40,00	40,13	40,00	40,93
10	60,00	60,13	60,00	61,13
11	80,00	80,20	80,00	81,33
12	100,00	100,33	100,00	101,53
13	120,00	120,33	120,00	121,67
14	160,00	160,53	160,00	162,07
15	200,00	200,73	200,00	202,33
16	300,00	301,33	300,00	303,20
17	400,00	401,80	400,00	403,87
18	600,00	602,73	600,00	605,07
19	900,00	903,40	900,00	906,00
20	1200,00	1202,80	1200,00	1205,40
21	1600,00	1600,00	1600,00	1600,40

Unit: kPa

Zero-load error:	=	0,008	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,213	% FSO
Hysteresis:	=	0,162	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,056	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue **27/05/2021**

CONE CALIBRATION CERTIFICATE

N° Z128/21

Calibrated system (Sistema tarato) :

Serial number **Mks866**
Sensor **PORE PRESSURE**
Max. Capacity [kPa]: **2500**
Scaling Factor: **10462**

Sensor **TILT ANGLE**
Max. Inclination [°]: **20**
Scaling Factor: **278279**

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Pressure Generator:

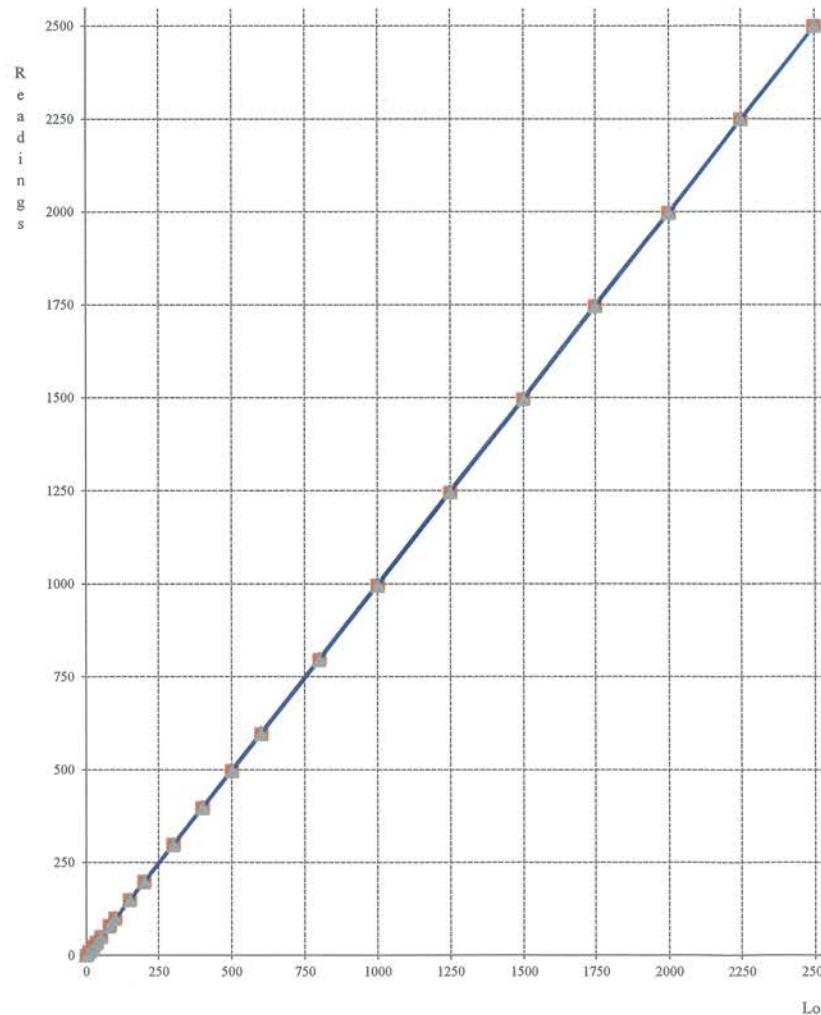
Manufacturer **MENSOR**
Model **CPC 4000**
Serial Number **41000V56**
Sensor Descr **Silicon Pressure Transducer**
Sensor Serial Number **41000SYF**

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: **04/05/2021**
Certificate N. **0288-SP-21**

Temperature of calibration **22°C**
Humidity **45%**

Factory calibration in accordance with **ASTM D5778-12**



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,10	0,10
2	10,00	10,00	9,90	9,90
3	25,00	25,00	25,00	24,80
4	35,00	35,00	35,00	34,70
5	50,00	50,10	50,00	49,50
6	80,00	80,00	80,00	79,10
7	100,00	99,80	100,00	98,90
8	150,00	149,40	149,90	148,40
9	200,00	199,00	200,00	198,00
10	300,00	298,20	299,90	297,40
11	400,00	397,60	399,90	396,90
12	500,00	497,10	500,00	496,70
13	600,00	596,70	599,80	596,30
14	800,00	796,20	799,80	795,90
15	1000,00	995,80	1000,00	996,10
16	1250,00	1245,90	1250,00	1246,20
17	1500,00	1496,30	1500,00	1496,50
18	1749,90	1746,90	1750,00	1746,90
19	2000,00	1997,70	2000,00	1997,80
20	2249,90	2248,80	2250,00	2248,70
21	2500,00	2500,00	2500,00	2500,00

Unit: kPa

Zero-load error:	=	0,000	% FSO
Nonlinearity:	=	0,168	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

Date of issue **27/05/2021**

CONE CALIBRATION CERTIFICATE
N° Z128/21

Calibrated system (Sistema tarato) :

Serial number	Mks866
Tip net area ratio (a_n):	0,7879
Sleeve net ratio (b_n):	0,0000

Addressee (destinatario) :

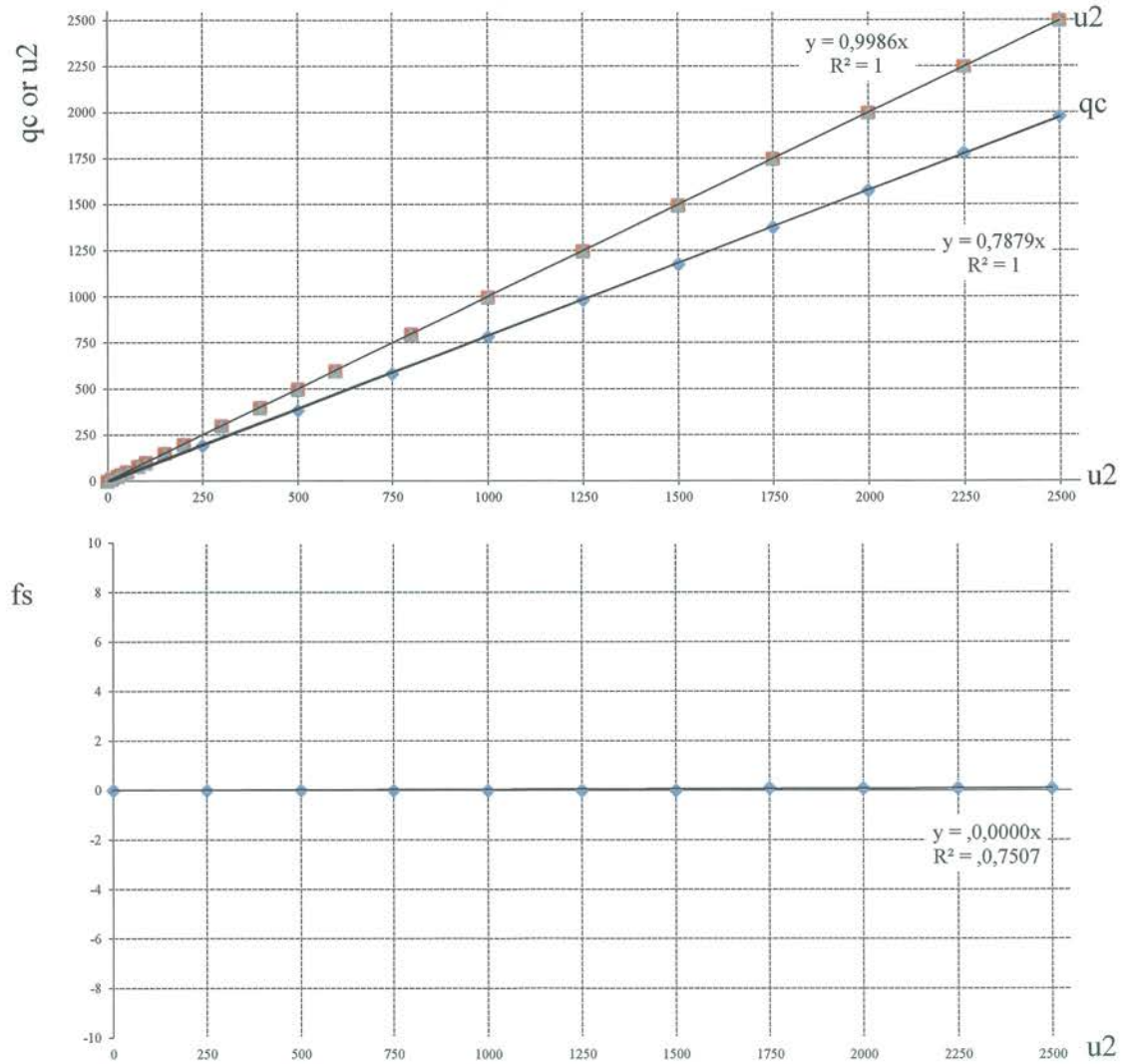
Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

	u2 (kPa)	qc (kPa)	fs (kPa)	u2 (psi)	qc (psi)	fs (psi)
0 (0)	0,00	0,00	0,00	0,00	0,00	0,00
250 (36,26)	249,90	194,00	0,00	248,10	28,14	0,00
500 (72,52)	500,00	383,00	0,00	497,20	55,55	0,00
750 (108,78)	750,00	582,00	0,00	746,70	84,41	0,00
1000 (145,04)	1000,00	782,00	0,00	996,70	113,42	0,00
1250 (181,30)	1250,00	981,00	0,00	1246,70	142,28	0,00
1500 (217,56)	1500,00	1176,00	0,00	1497,00	170,56	0,00
1750 (253,82)	1750,00	1375,00	0,10	1747,80	199,43	0,01
2000 (290,08)	2000,00	1575,00	0,10	1998,60	228,43	0,01
2250 (326,33)	2250,00	1780,00	0,10	2249,70	258,17	0,01
2500 (362,59)	2500,00	1980,00	0,10	2501,10	287,17	0,01

Unit: kPa - (psi)

Temperature of calibration	22°C
Humidity	45%

Factory calibration in accordance with *ASTM D5778-12*



The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by  Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE
N° Z128/21

Calibrated system (Sistema tarato) :

Serial number Mks866
Sensor TEMPERATURE
Max. Temperature [°C]: 50
Scaling Factor: 467882

Addressee (destinatario) :

Ground Investigation I.t.d.
unit 1B 43 the Concourse PO Box 21-956, Henderson
Auckland 0650, New Zealand

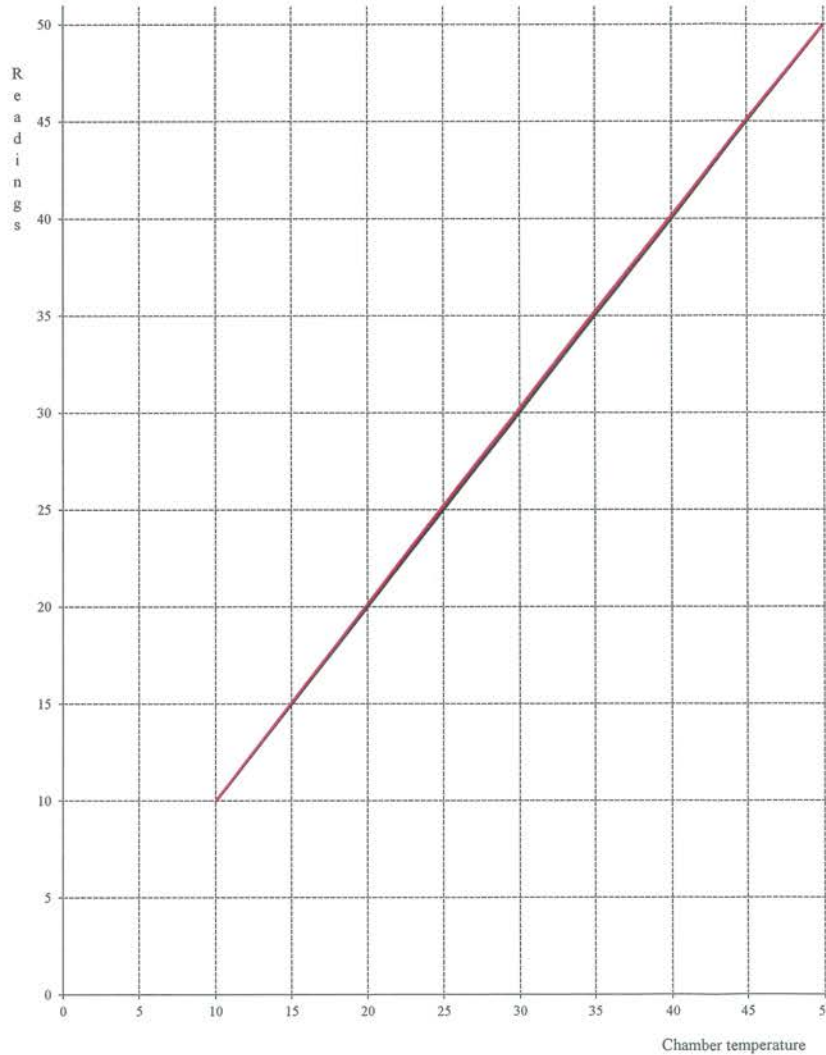
Psychrometric system:
(Sistema psicrometrico)

Manufacturer ATT Angelantoni
Model DY340
Serial Number TT00210

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: 03/04/2013
Certificate N. 021/13

Temperature of calibration _____
Humidity 25%



	Ch temp	Readings
1	10,00	10,00
2	20,00	20,15
3	30,00	30,22
4	40,00	40,15
5	50,00	50,00

Unit: °C

Cone calibrated by 

Date of issue 27/05/2021

CONE CALIBRATION CERTIFICATE N° Z295/22

Calibrated system (Sistema tarato) :

Serial number	Mks167
Sensor	TIP RESISTANCE
Max. Capacity [MPa]:	50
Scaling Factor:	191640
Tip net area ratio (a _n):	0,80
Sleeve net ratio (b _n):	0,00

Addressee (destinatario) :

Ground Investigation l.t.d.
29 Hogarth Rise - West Harbour
Auckland 0618 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer	AEP transducers
Model	KAL 200 kN
Serial Number	138913

Power press:

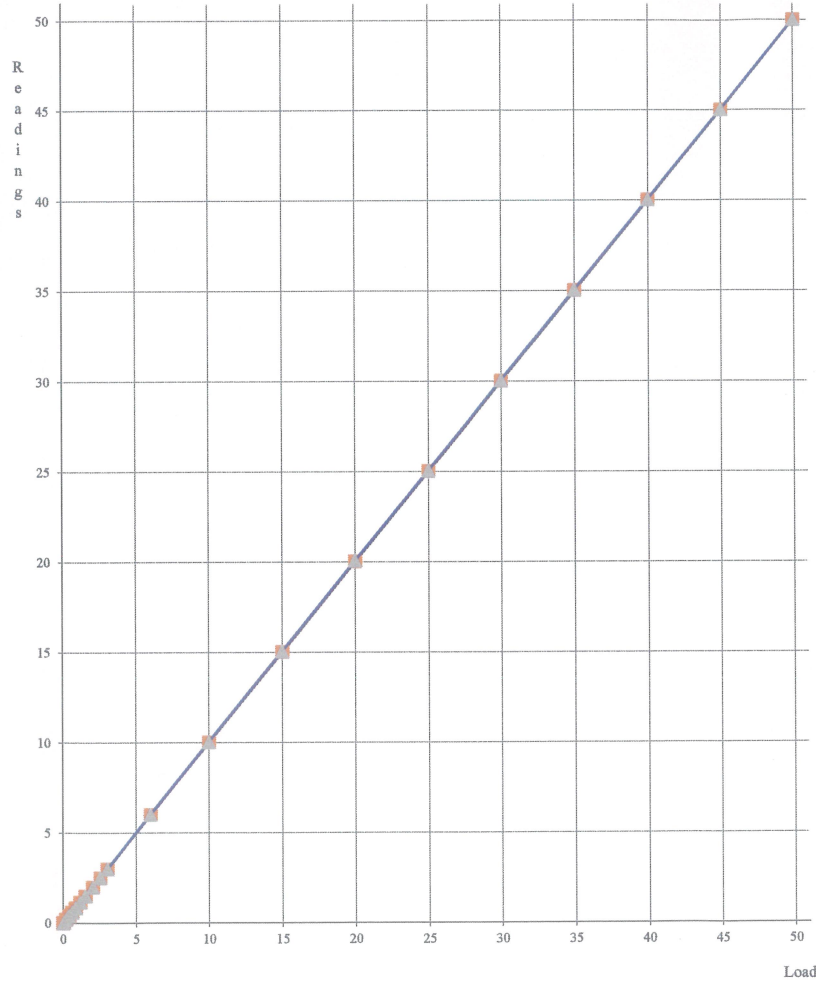
Manufacturer	Easydur Italiana
Model	Aura 20T
Serial Number	29084

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	11/01/2022
Certificate N.	LAT 091 2022-004

Temperature of calibration	22°C
Humidity	25%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months
ISO 22476-1 (App Class2) Validity 6 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	-0,01
2	0,03	0,03	0,03	0,03
3	0,20	0,20	0,20	0,20
4	0,40	0,40	0,40	0,40
5	0,60	0,60	0,60	0,60
6	0,85	0,85	0,85	0,85
7	1,15	1,15	1,15	1,15
8	1,50	1,50	1,50	1,50
9	2,00	2,00	2,00	2,00
10	2,50	2,50	2,50	2,51
11	3,00	3,00	3,00	3,00
12	6,00	6,01	6,00	6,01
13	10,00	10,02	10,00	10,03
14	15,00	15,03	15,00	15,04
15	20,00	20,03	20,00	20,05
16	25,00	25,04	25,00	25,05
17	30,00	30,04	30,00	30,06
18	35,00	35,03	35,00	35,05
19	40,00	40,03	40,00	40,04
20	45,00	45,02	45,00	45,02
21	50,00	50,00	50,00	50,00

Unit: Mpa

Zero-load error:	=	0,010	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,074	% FSO
Hysteresis:	=	0,042	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,031	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

10/11/2022

CONE CALIBRATION CERTIFICATE
N° Z295/22

Calibrated system (Sistema tarato) :

Serial number **Mks167**
Sensor **SLEEVE FRICTION**
Max. Capacity [kPa]: **1600**
Scaling Factor: **30966**

Addressee (destinatario) :

Ground Investigation I.t.d.
29 Hogarth Rise - West Harbour
Auckland 0618 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Load cell:

Manufacturer **AEP transducers**
Model **KAL 200 kN**
Serial Number **138913**

Power press:

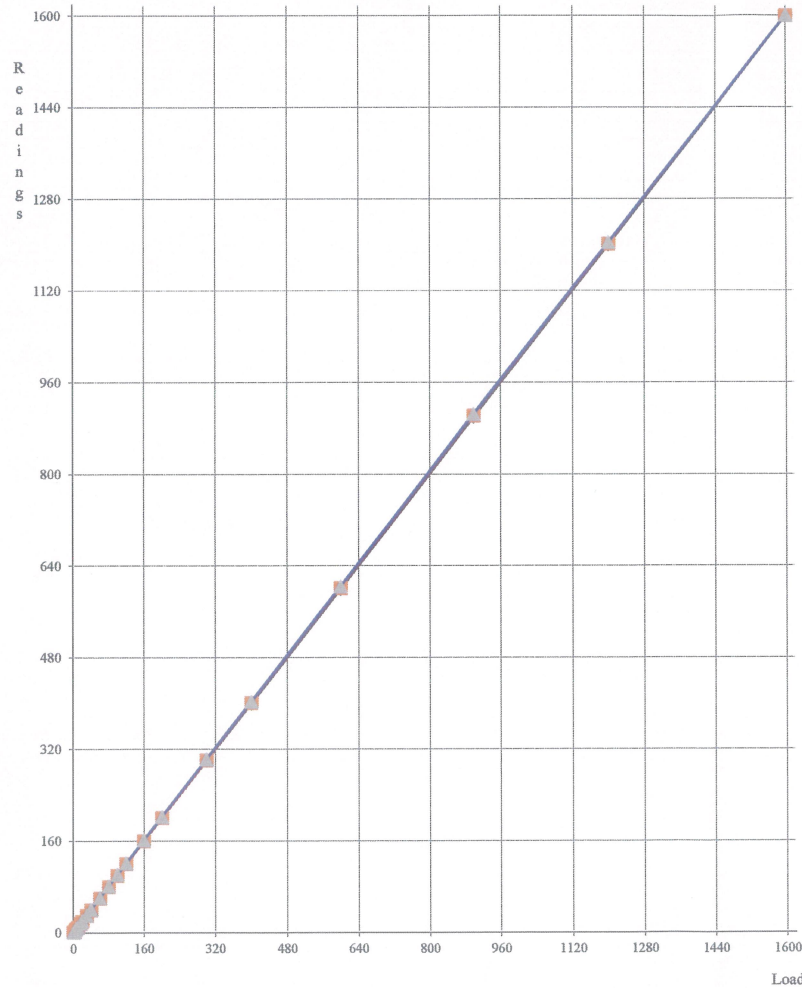
Manufacturer **Easydur Italiana**
Model **Aura 20T**
Serial Number **29084**

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: **11/01/2022**
Certificate N. **LAT 091 2022-004**

Temperature of calibration **22°C**
Humidity **25%**

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months
ISO 22476-1 (App Class2) Validity 6 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	0,00	0,00	0,00	0,20
2	2,00	1,73	2,00	2,07
3	5,00	4,67	5,00	5,07
4	7,00	6,60	7,00	7,07
5	10,00	9,67	10,00	10,20
6	16,00	15,60	16,00	16,20
7	20,00	19,60	20,00	20,27
8	30,00	29,67	30,00	30,40
9	40,00	39,67	40,00	40,47
10	60,00	59,73	60,00	60,67
11	80,00	79,80	80,00	80,87
12	100,00	99,87	100,00	101,07
13	120,00	120,00	120,00	121,20
14	160,00	160,07	160,00	161,47
15	200,00	200,20	200,00	201,80
16	300,00	300,60	300,00	302,47
17	400,00	400,93	400,00	402,93
18	600,00	601,53	600,00	603,87
19	900,00	902,00	900,00	904,33
20	1200,00	1201,60	1200,00	1203,80
21	1600,00	1600,00	1600,00	1600,27

Unit: kPa

Zero-load error:	=	0,013	% FSO
Zero-load thermal stability:	<=	1,000	% FSO
Nonlinearity:	=	0,125	% FSO
Hysteresis:	=	0,146	% FSO
Calibration error:	=	0,000	% MO
Apparent load:	=	0,053	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by



10/11/2022

CONE CALIBRATION CERTIFICATE N° Z295/22

Calibrated system (Sistema tarato) :

Serial number	Mks167
Sensor	PORE PRESSURE
Max. Capacity [kPa]:	2500
Scaling Factor:	10788
Sensor	TILT ANGLE
Max. Inclination [°]:	20
Scaling Factor:	338352

Addressee (destinatario) :

Ground Investigation I.t.d.
29 Hogarth Rise - West Harbour
Auckland 0618 - (New Zealand)

Applied load measurement system:

(Sistema di rilevamento del carico applicato)

Pressure Generator:

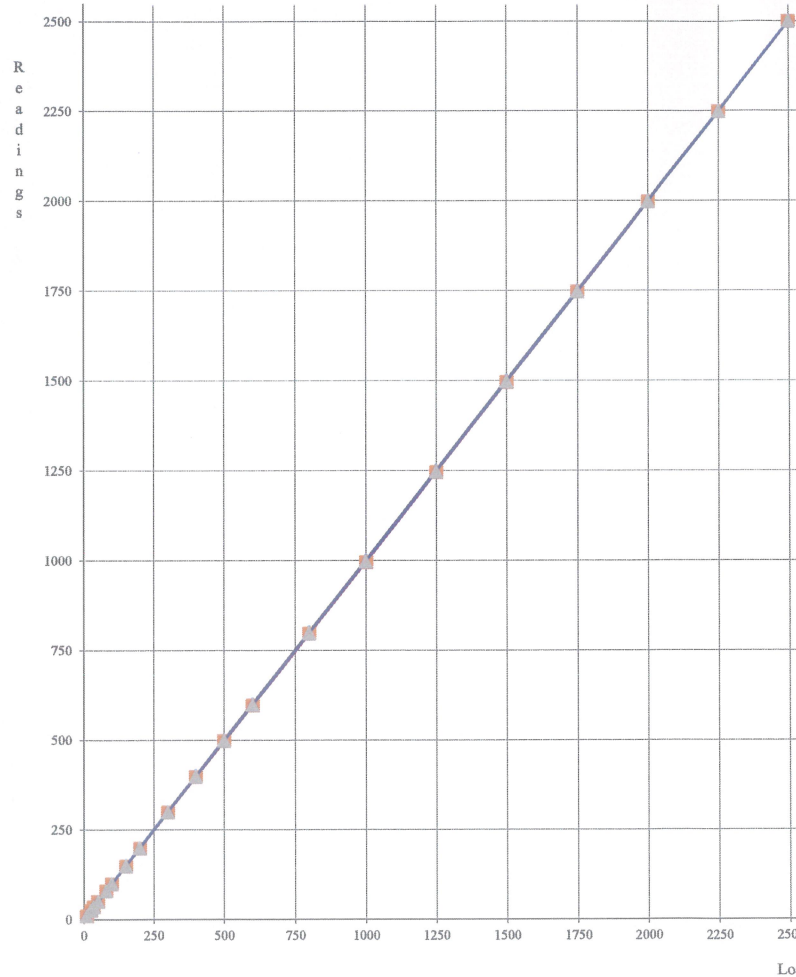
Manufacturer	MENSOR
Model	CPC 4000
Serial Number	41000V56
Sensor Descr	Silicon Pressure Transducer
Sensor Serial Number	41000V3Y

The measurement system is periodically checked in a SIT calibration center. *(Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)*

Last verification date:	22/04/2022
Certificate N.	0284-SP-22

Temperature of calibration	22°C
Humidity	25%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months
ISO 22476-1 (App Class2) Validity 6 Months



	Ascending		Descending	
	Load	Readings	Load	Readings
1	-0,10	0,00	0,00	-0,30
2	10,00	10,00	9,80	9,50
3	25,00	24,80	25,00	24,70
4	35,00	34,80	35,00	34,70
5	50,00	49,50	50,00	49,60
6	80,00	79,20	80,00	79,40
7	100,00	99,40	100,00	99,50
8	150,00	149,00	150,00	149,20
9	200,00	198,50	199,90	198,90
10	300,00	297,90	300,00	298,70
11	400,00	397,60	400,00	398,10
12	500,00	497,10	499,90	497,80
13	600,00	596,70	600,00	597,70
14	800,00	796,00	800,00	797,50
15	1000,00	995,60	999,90	997,40
16	1250,00	1245,80	1250,00	1247,30
17	1500,00	1496,30	1500,00	1497,40
18	1750,00	1746,70	1750,00	1747,60
19	2000,00	1997,70	1999,90	1998,20
20	2250,00	2248,70	2250,00	2249,10
21	2500,00	2500,00	2500,00	2500,20

Unit: kPa

Zero-load error:	=	0,016	% FSO
Nonlinearity:	=	0,176	% FSO

The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by 

10/11/2022

CONE CALIBRATION CERTIFICATE

N° Z295/22

Calibrated system (Sistema tarato) :

Serial number **Mks167**
Tip net area ratio (a_n): **0,7915**
Sleeve net ratio (b_n): **0,0000**

Addressee (destinatario) :

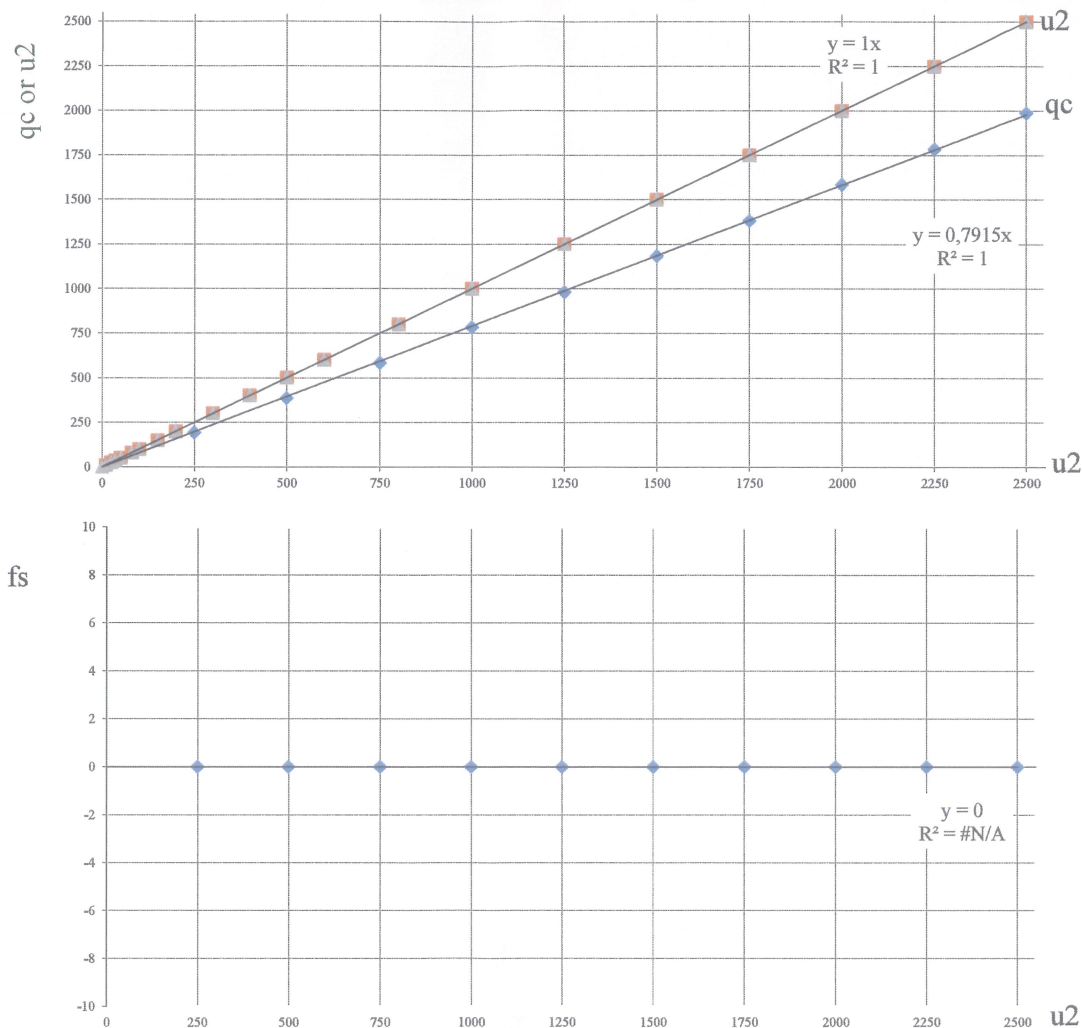
Ground Investigation I.t.d.
29 Hogarth Rise - West Harbour
Auckland 0618 - (New Zealand)

	u2 (kPa)	qc (kPa)	fs (kPa)	u2 (psi)	qc (psi)	fs (psi)
0 (0)	-0,10	0,00	0,00	0,00	0,00	0,00
250 (36,26)	250,00	193,00	0,00	249,30	27,99	0,00
500 (72,52)	500,00	386,00	0,00	498,60	55,98	0,00
750 (108,78)	750,00	584,00	0,00	748,10	84,70	0,00
1000 (145,04)	1000,00	783,00	0,00	998,10	113,56	0,00
1250 (181,30)	1250,00	981,00	0,00	1248,30	142,28	0,00
1500 (217,56)	1500,00	1185,00	0,00	1498,80	171,87	0,00
1750 (253,82)	1750,00	1383,00	0,00	1749,30	200,59	0,00
2000 (290,08)	2000,00	1586,00	0,00	2000,10	230,03	0,00
2250 (326,33)	2250,00	1785,00	0,00	2251,40	258,89	0,00
2500 (362,59)	2500,00	1988,00	0,00	2502,90	288,33	0,00

Unit: kPa - (psi)

Temperature of calibration 22°C
Humidity 45%

Factory calibration in accordance with :
ASTM D5778-12 Validity 12 Months
ISO 22476-1 (App Class2) Validity 6 Months



The adopted calibration procedure has been developed according to the suggestions given by Prof. Paul W. Mayne (Georgia Institute of technology) and Prof. Diego Lo Presti (University of Pisa)

Cone calibrated by



Date of issue

10/11/2022

CONE CALIBRATION CERTIFICATE
N° Z295/22

Calibrated system (Sistema tarato) :

Serial number Mks167
Sensor TEMPERATURE
Max. Temperature [°C]: 50
Scaling Factor: 505712

Addressee (destinatario) :

Ground Investigation I.t.d.
29 Hogarth Rise - West Harbour
Auckland 0618 - (New Zealand)

Psychrometric system:

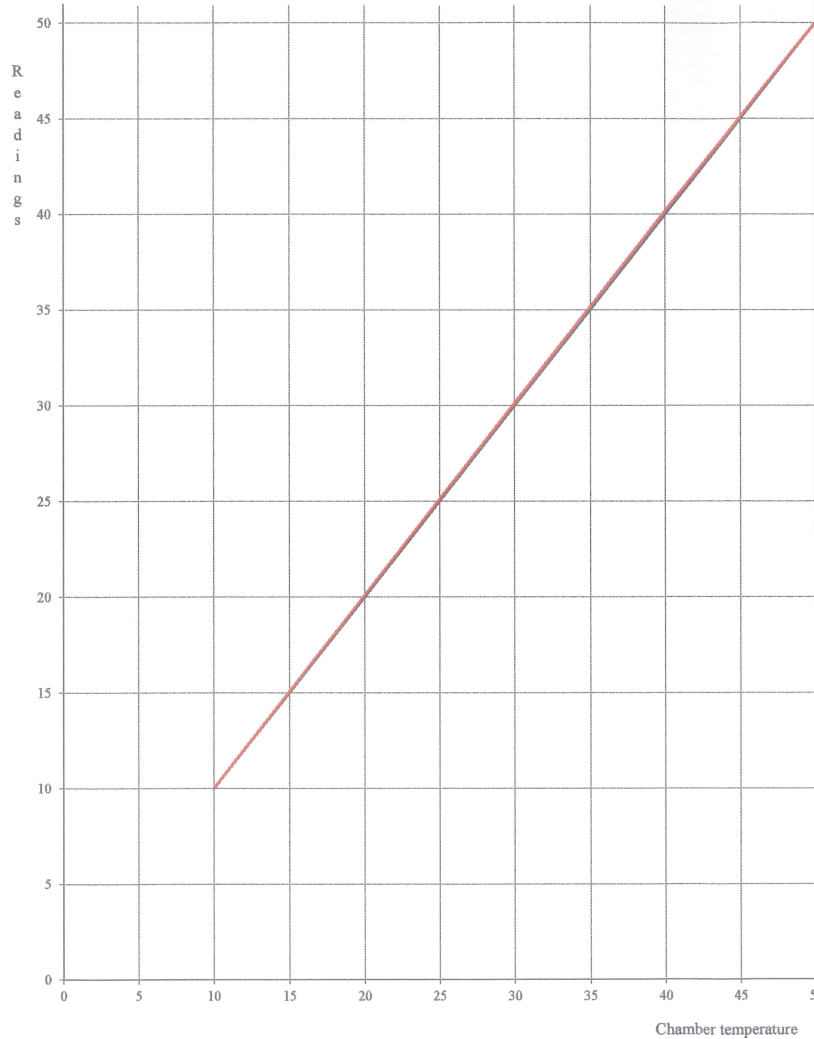
(Sistema psicrometrico)

Manufacturer ATT Angelantoni
Model DY340
Serial Number TT00210

The measurement system is periodically checked in a SIT calibration center. (Il sistema di rilevamento è sottoposto a verifica periodica presso un centro SIT)

Last verification date: 03/04/2013
Certificate N. 021/13

Temperature of calibration
Humidity 52%



	Ch temp	Readings
1	10,00	10,00
2	20,00	20,08
3	30,00	30,10
4	40,00	40,15
5	50,00	50,00

Unit: °C

Cone calibrated by 

Date of issue 10/11/2022

Certificate Number
221215-130827-CT

Cone Calibration - Cone Tip

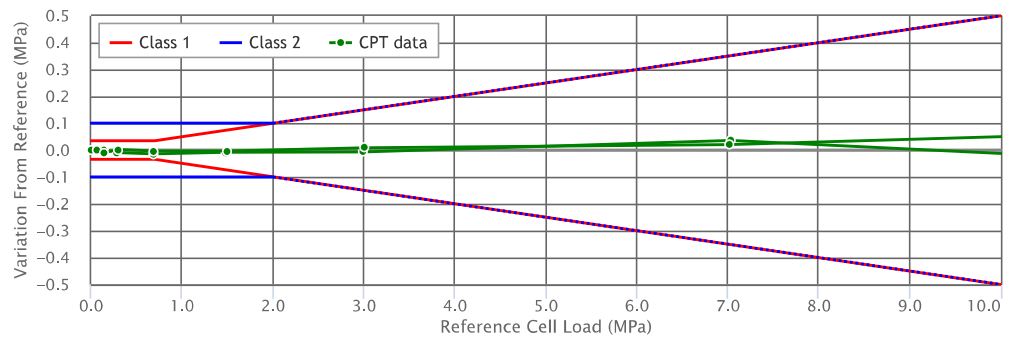
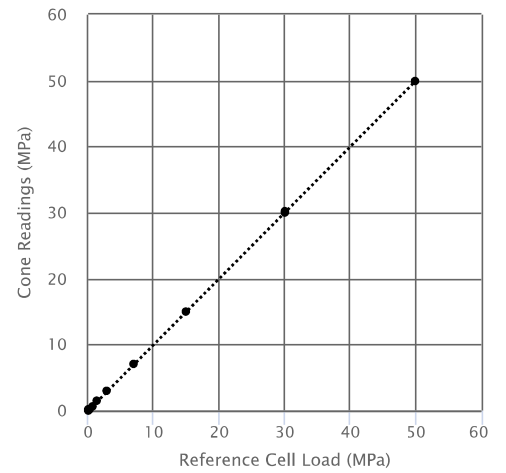
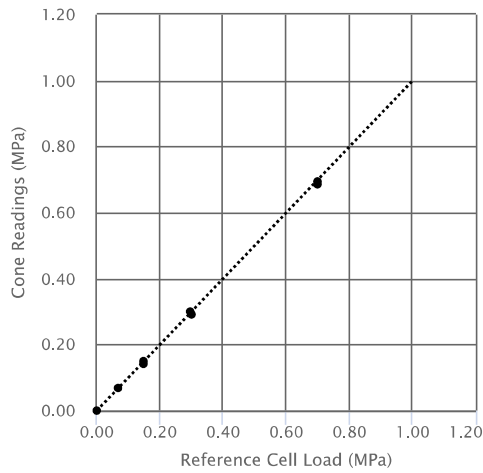


Cone Details

Cone Number	MKJ300
Cone Manufacturer	Pagani
Capacity (MPa)	50
Calibration Date	15-12-2022
Calibrated By	SB
Cone Area (cm ²)	10
Cone Area Ratio	0.79

Zero Readings

Scaling Factor	192.454
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	4039
Final Zero Reading	4038
Zero Difference (kPa)	-5.20
Resolution (kPa)	5.20
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.96%



Certificate Number
221215-130827-FS

Cone Calibration - Friction Sleeve

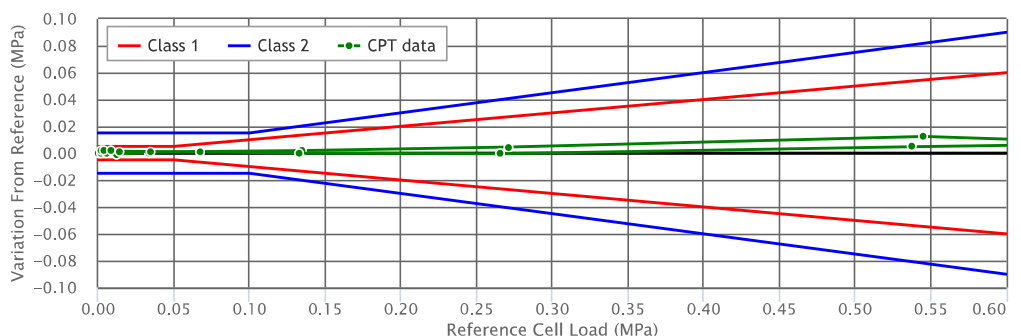
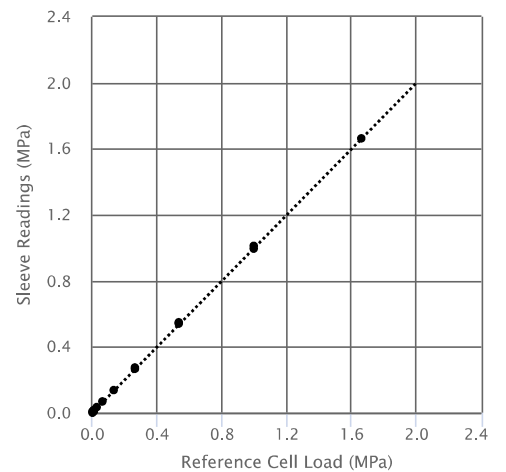
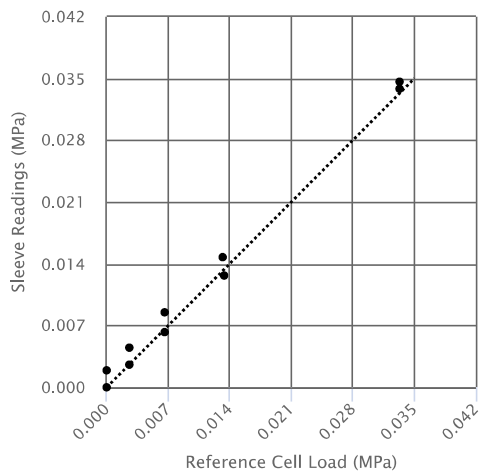


Cone Details

Cone Number	MKJ300
Cone Manufacturer	Pagani
Capacity (MPa)	1.6
Calibration Date	15-12-2022
Calibrated By	SB
Sleeve Area (cm ²)	150

Zero Readings

Scaling Factor	2013.632
Scaling Range (FSO)	0 to 0.1%
Initial Zero Reading	8505
Final Zero Reading	8563
Zero Difference (kPa)	28.80
Resolution (kPa)	0.50
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	0%



Certificate Number
221215-130827-PP

Cone Calibration - Pore Pressure

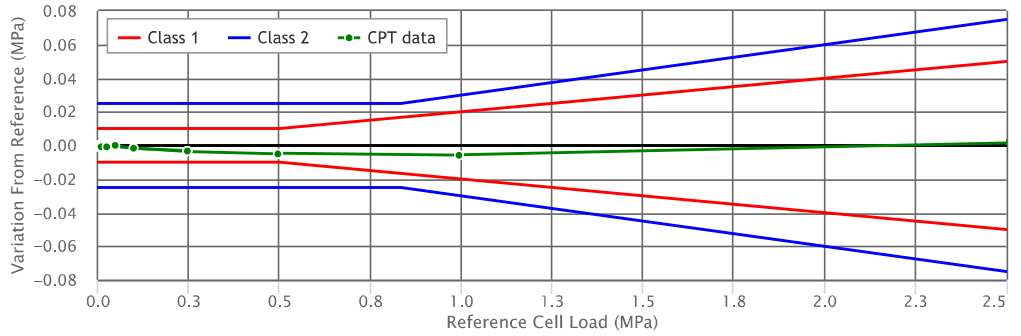
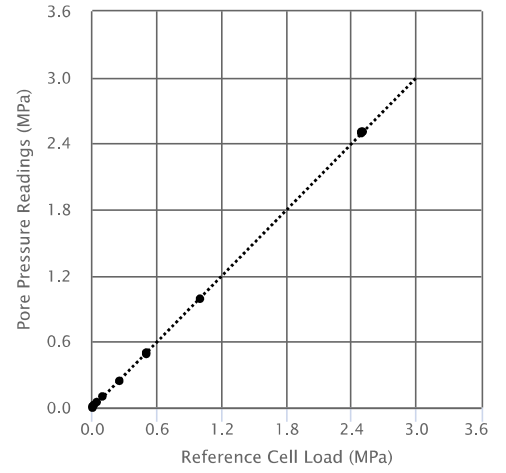
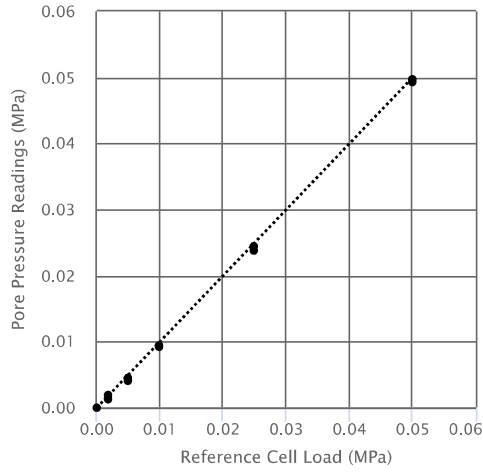


Cone Details

Cone Number	MKJ300
Cone Manufacturer	Pagani
Capacity (MPa)	2.5
Calibration Date	15-12-2022
Calibrated By	SB

Zero Readings

Scaling Factor	11.144
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	31499
Final Zero Reading	31500
Zero Difference (kPa)	0.09
Resolution (kPa)	0.09
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.96%



Certificate Number
230208-161420-CT

Cone Calibration - Cone Tip

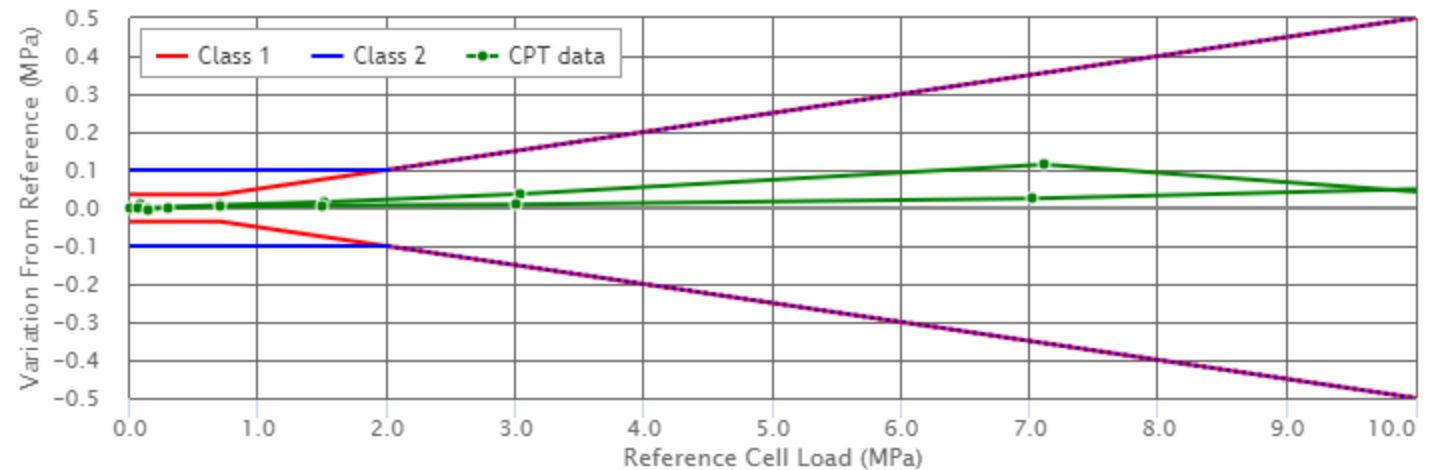
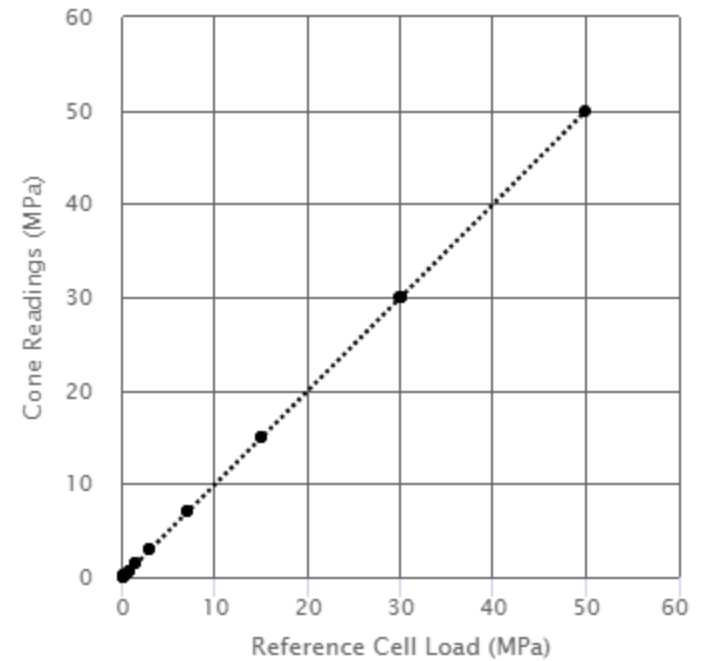
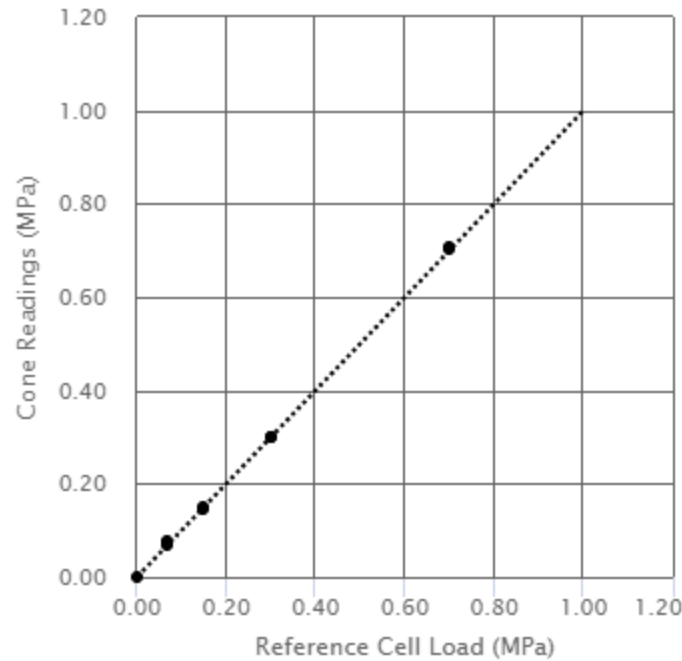


Cone Details

Cone Number	MKJ311
Cone Manufacturer	Pagani
Capacity (MPa)	50
Calibration Date	08-02-2023
Calibrated By	SB
Cone Area (cm ²)	10
Cone Area Ratio	0.79

Zero Readings

Scaling Factor	192.014
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	4030
Final Zero Reading	4029
Zero Difference (kPa)	-5.21
Resolution (kPa)	5.21
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.97%



Certificate Number
230208-161420-FS

Cone Calibration - Friction Sleeve

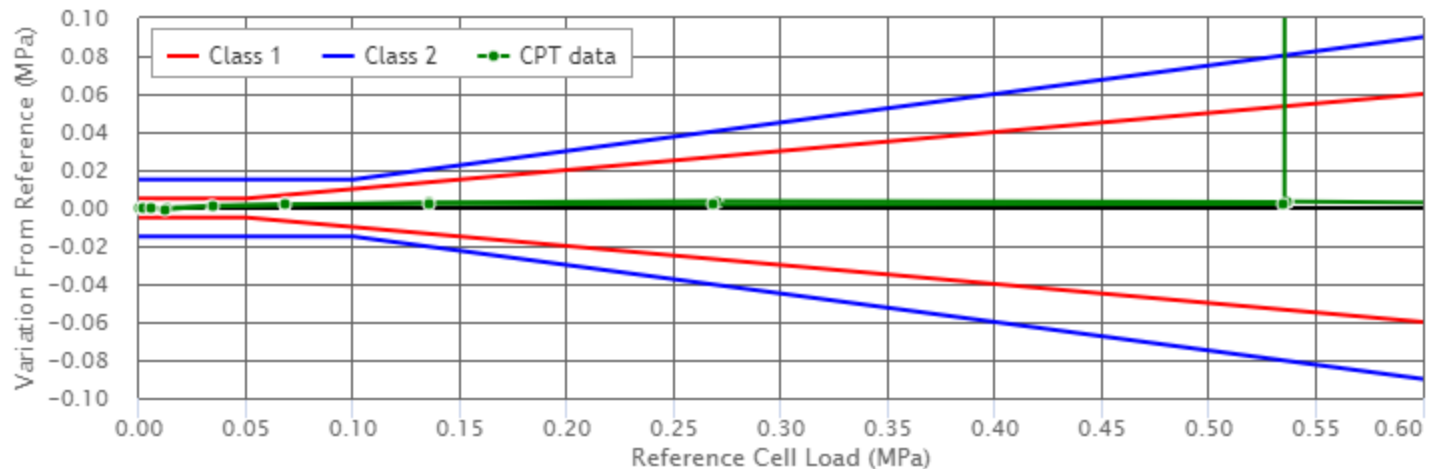
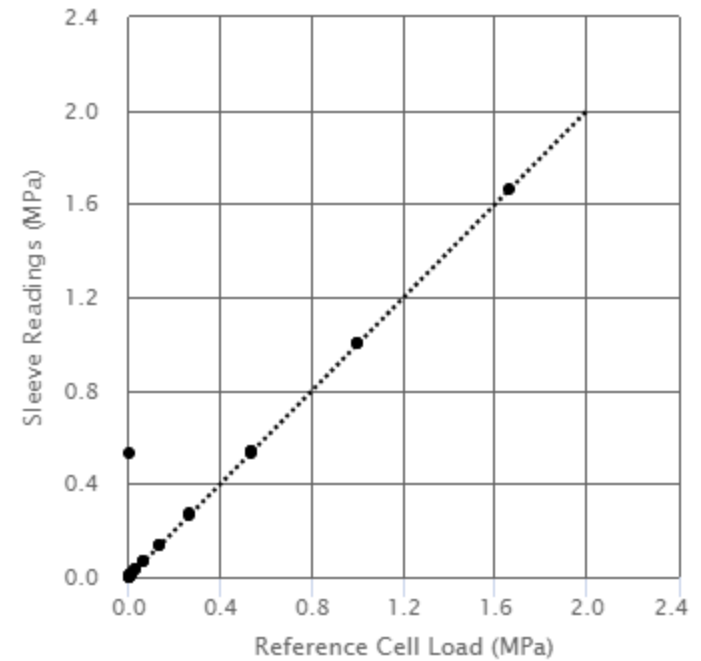
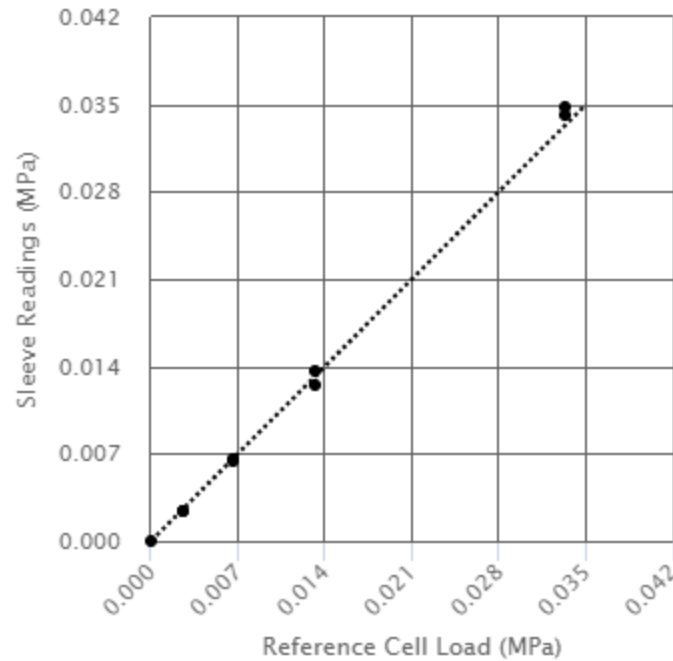


Cone Details

Cone Number	MKJ311
Cone Manufacturer	Pagani
Capacity (MPa)	1.6
Calibration Date	08-02-2023
Calibrated By	SB
Sleeve Area (cm ²)	150

Zero Readings

Scaling Factor	2089.051
Scaling Range (FSO)	0 to 0.1%
Initial Zero Reading	16550
Final Zero Reading	16545
Zero Difference (kPa)	-2.39
Resolution (kPa)	0.48
R ² Full Range (%)	93.49%
R ² Scaling Range (%)	100%



Certificate Number
230208-161420-PP

Cone Calibration - Pore Pressure

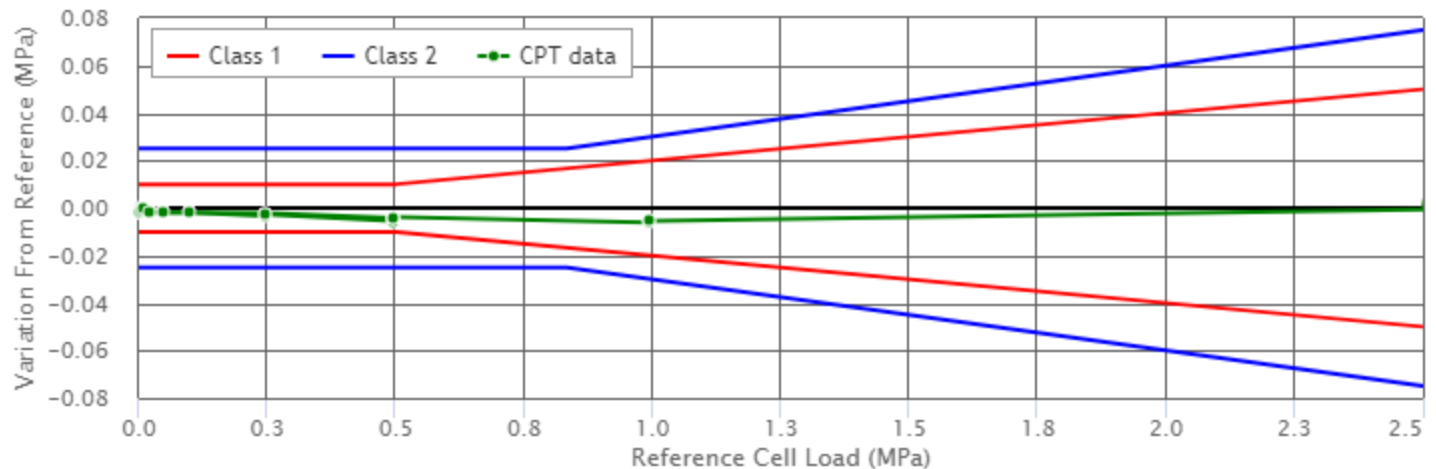
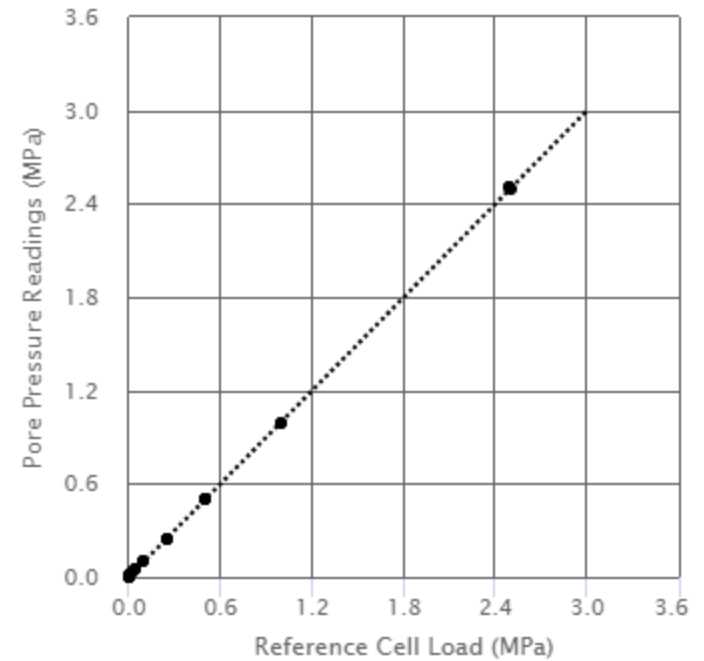
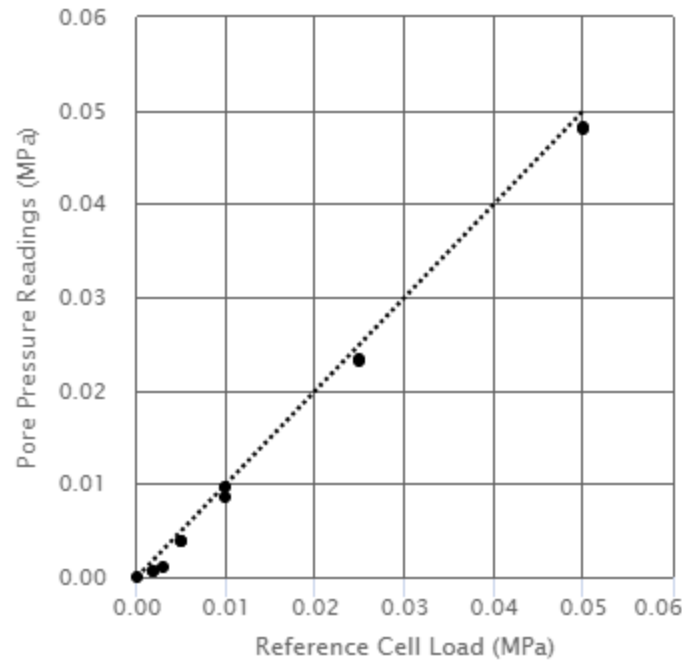


Cone Details

Cone Number	MKJ311
Cone Manufacturer	Pagani
Capacity (MPa)	2.5
Calibration Date	08-02-2023
Calibrated By	SB

Zero Readings

Scaling Factor	10.458
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	31515
Final Zero Reading	31510
Zero Difference (kPa)	-0.48
Resolution (kPa)	0.10
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.91%



Certificate Number
230208-205055-CT

Cone Calibration - Cone Tip

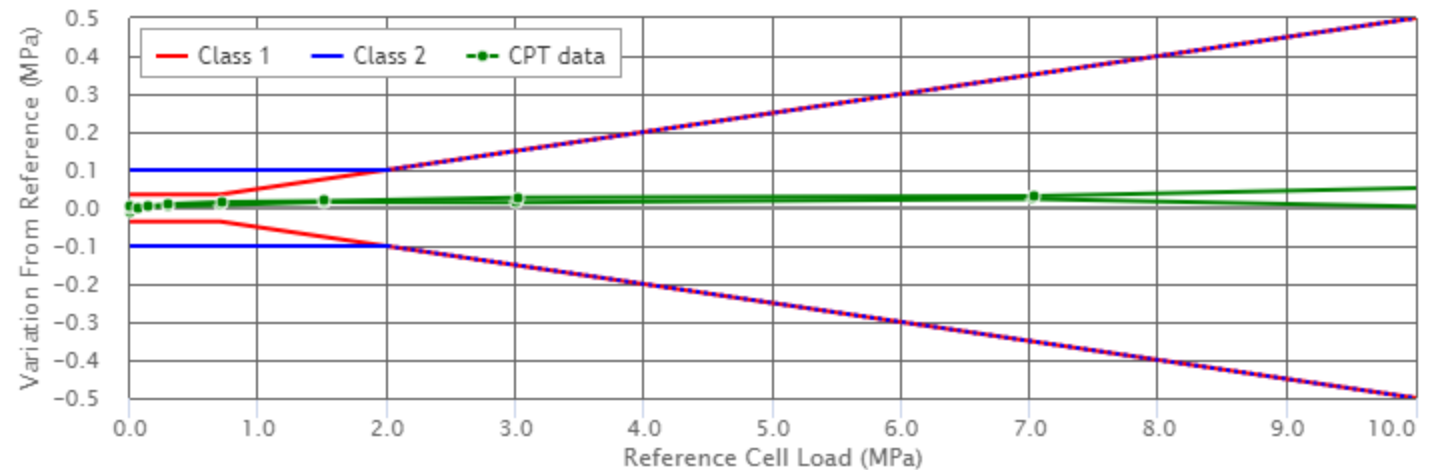
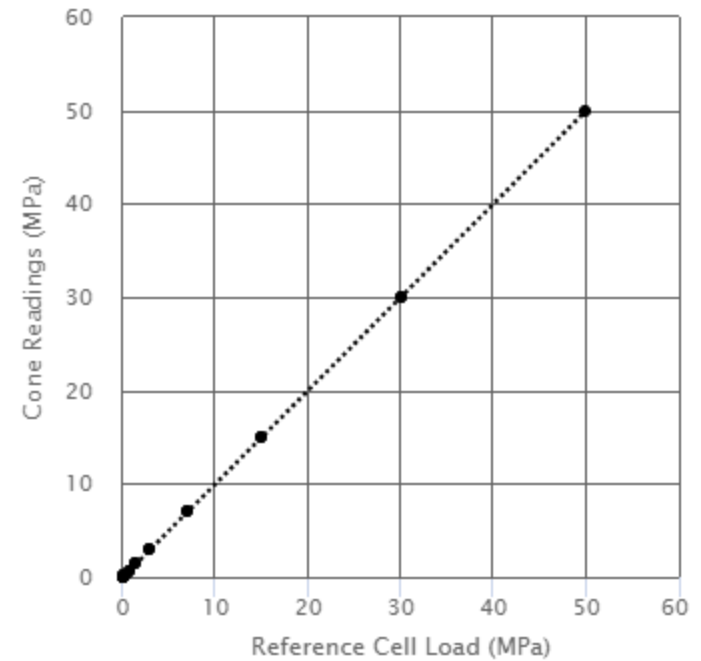
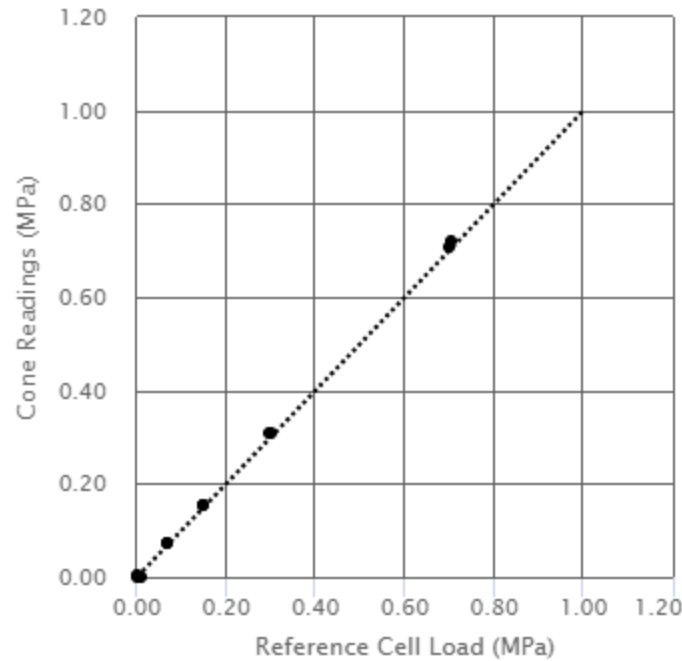


Cone Details

Cone Number	MKS865
Cone Manufacturer	Pagani
Capacity (MPa)	50
Calibration Date	08-02-2023
Calibrated By	SB
Cone Area (cm ²)	10
Cone Area Ratio	0.78

Zero Readings

Scaling Factor	180.811
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	4011
Final Zero Reading	4012
Zero Difference (kPa)	5.53
Resolution (kPa)	5.53
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.97%



Certificate Number
230208-205055-FS

Cone Calibration - Friction Sleeve

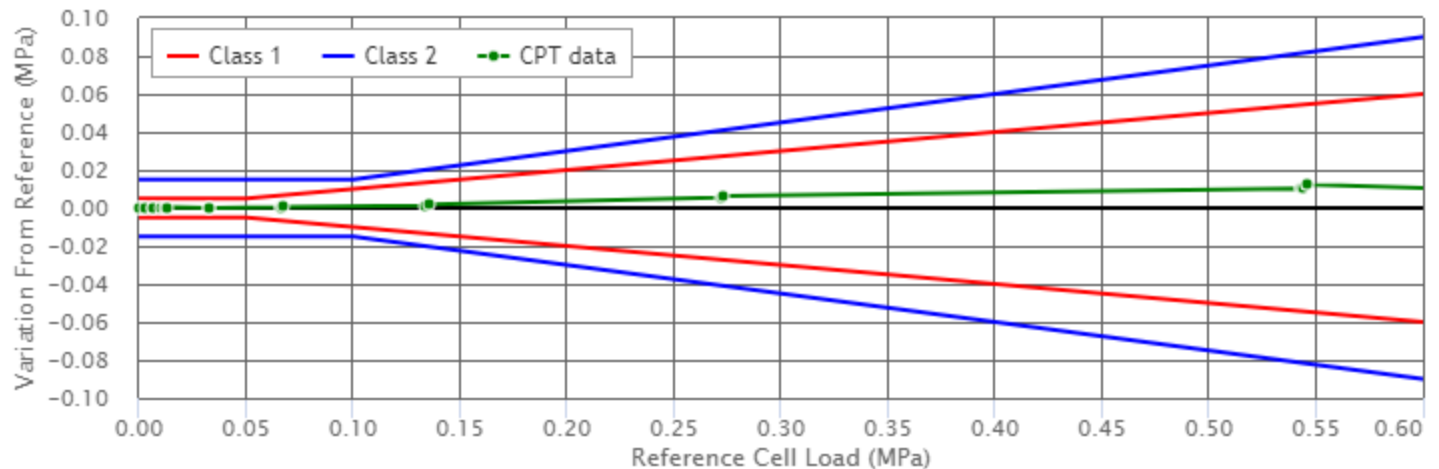
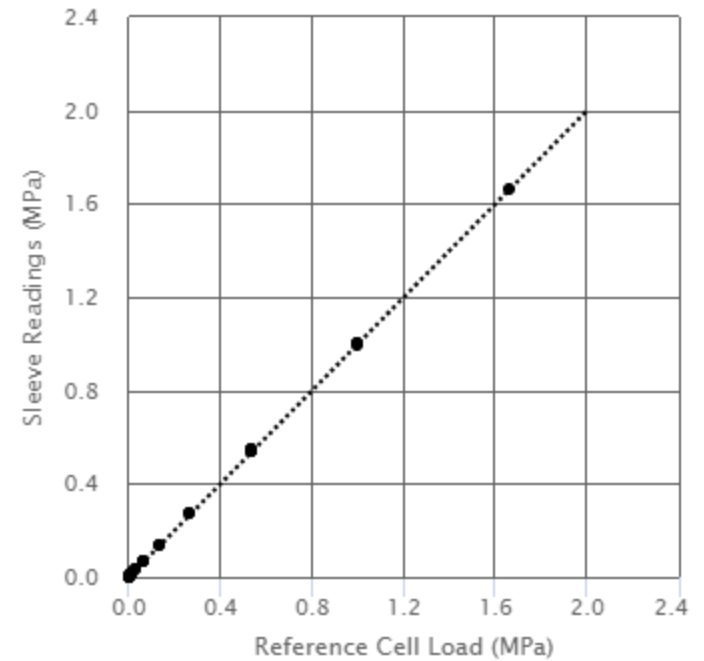
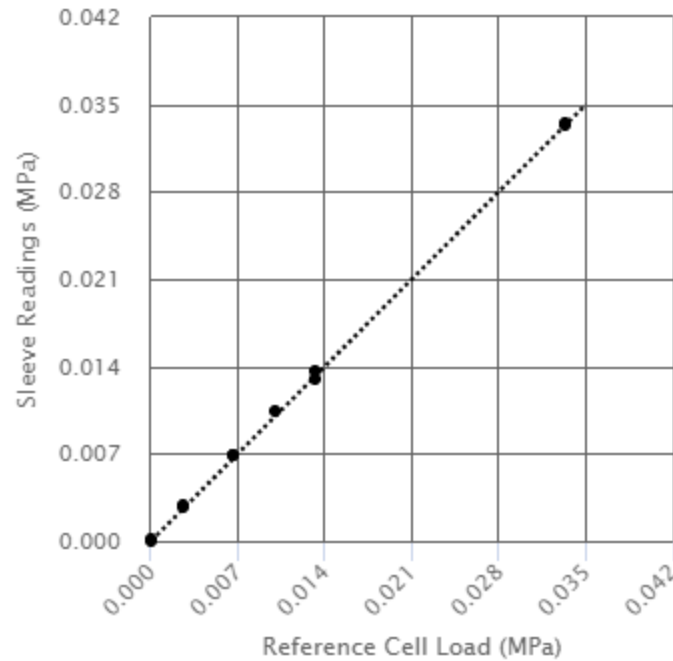


Cone Details

Cone Number	MKS865
Cone Manufacturer	Pagani
Capacity (MPa)	1.6
Calibration Date	08-02-2023
Calibrated By	SB
Sleeve Area (cm ²)	150

Zero Readings

Scaling Factor	2085.16
Scaling Range (FSO)	0 to 0.1%
Initial Zero Reading	8219
Final Zero Reading	8222
Zero Difference (kPa)	1.44
Resolution (kPa)	0.48
R ² Full Range (%)	99.98%
R ² Scaling Range (%)	0%



Certificate Number
230208-205055-PP

Cone Calibration - Pore Pressure

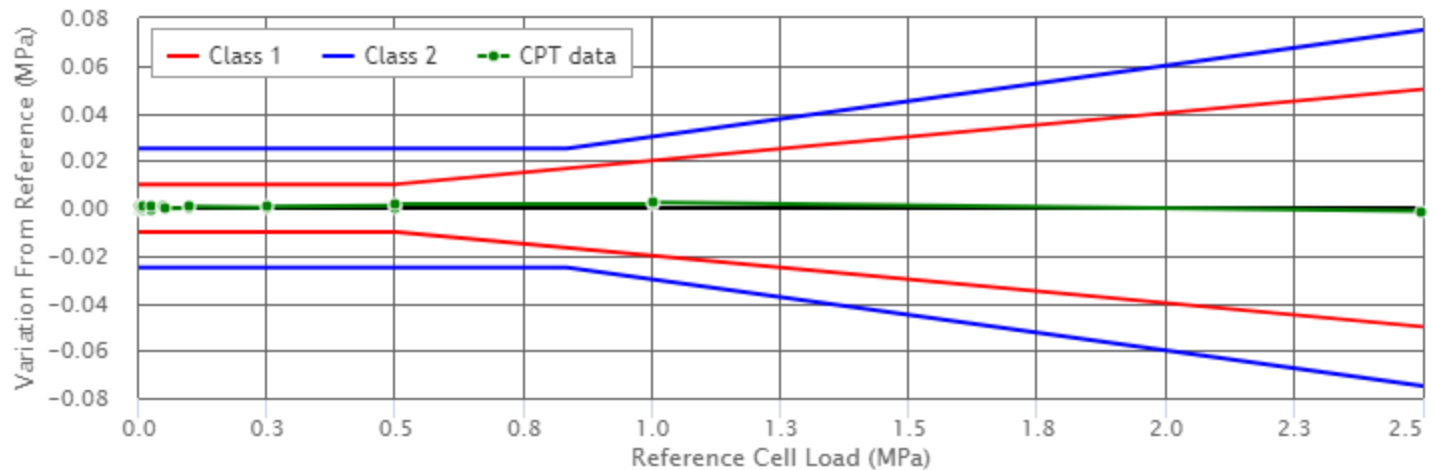
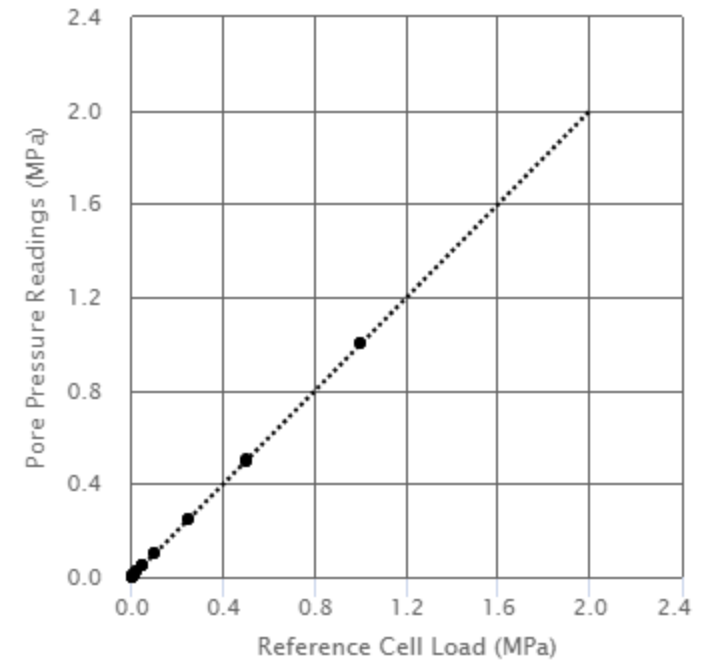
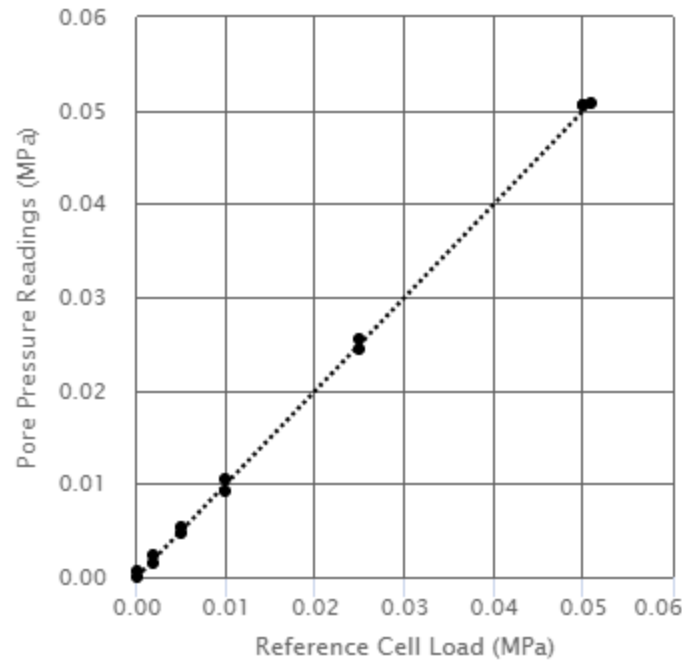


Cone Details

Cone Number	MKS865
Cone Manufacturer	Pagani
Capacity (MPa)	2.5
Calibration Date	08-02-2023
Calibrated By	SB

Zero Readings

Scaling Factor	10.673
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	32026
Final Zero Reading	32032
Zero Difference (kPa)	0.56
Resolution (kPa)	0.09
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.70%



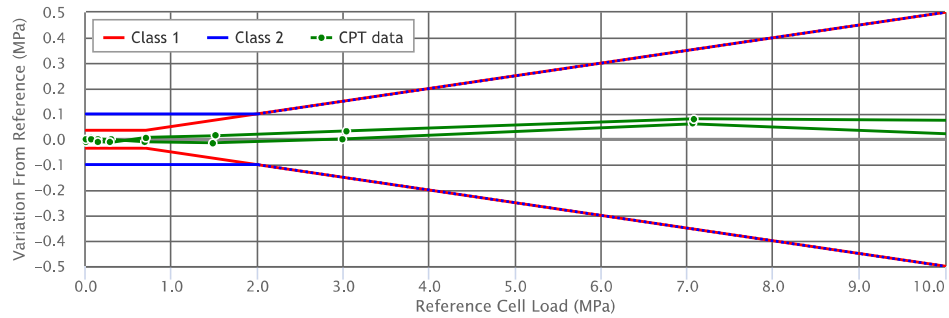
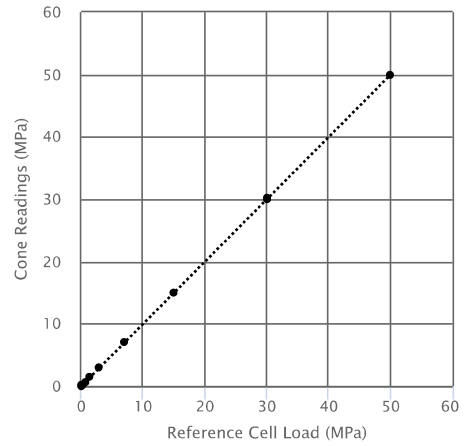
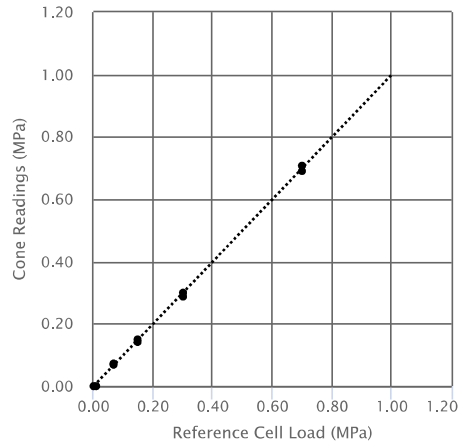
Certificate Number
221110-122613-CT

Cone Calibration - Cone Tip



Cone Details

Cone Number	MKJ208
Cone Manufacturer	Pagani
Capacity (MPa)	50
Calibration Date	10-11-2022
Calibrated By	SB
Cone Area (cm ²)	10
Cone Area Ratio	0.78



Zero Readings

Scaling Factor	190.916
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	3241
Final Zero Reading	3240
Zero Difference (kPa)	-5.24
Resolution (kPa)	5.24
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.94%

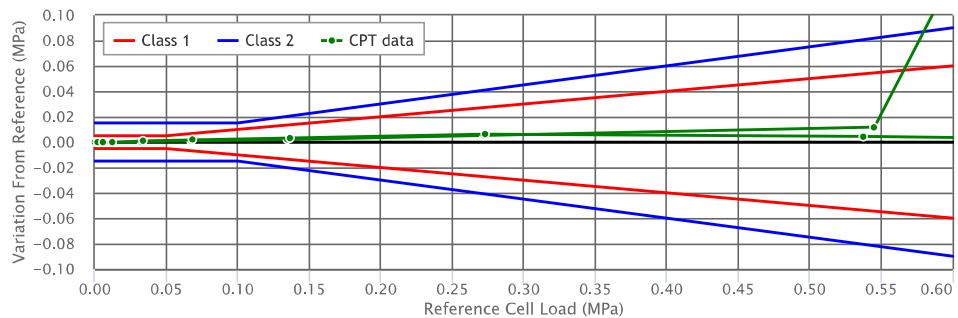
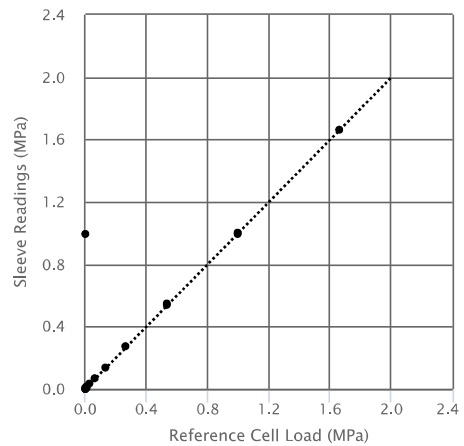
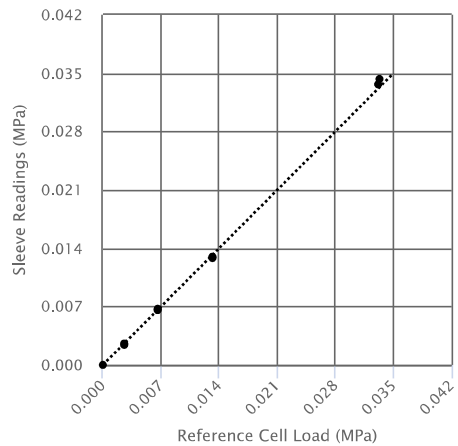
Certificate Number
221110-122613-FS

Cone Calibration - Friction Sleeve



Cone Details

Cone Number	MKJ208
Cone Manufacturer	Pagani
Capacity (MPa)	1.6
Calibration Date	10-11-2022
Calibrated By	SB
Sleeve Area (cm ²)	150



Zero Readings

Scaling Factor	2031.607
Scaling Range (FSO)	0 to 0.1%
Initial Zero Reading	8438
Final Zero Reading	8432
Zero Difference (kPa)	-2.95
Resolution (kPa)	0.49
R ² Full Range (%)	79.46%
R ² Scaling Range (%)	0%

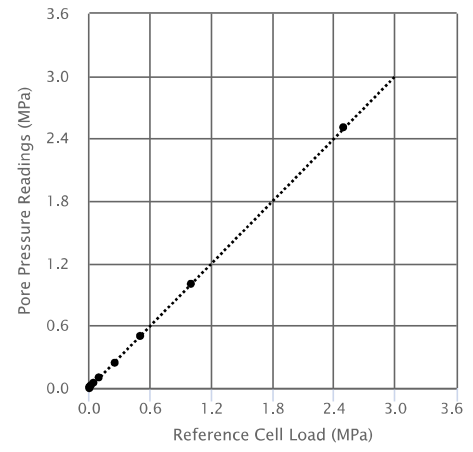
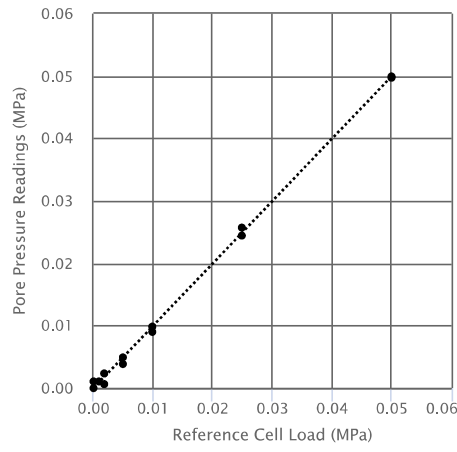
Certificate Number
224110-122613-PP

Cone Calibration - Pore Pressure



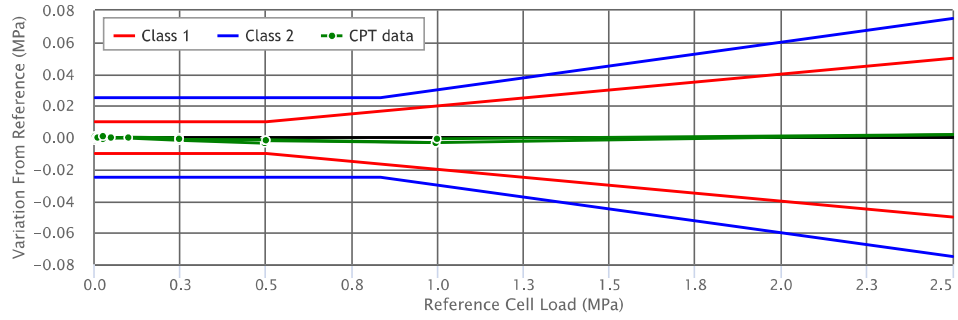
Cone Details

Cone Number	MKJ208
Cone Manufacturer	Pagani
Capacity (MPa)	2.5
Calibration Date	10-11-2022
Calibrated By	SB



Zero Readings

Scaling Factor	11.152
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	31311
Final Zero Reading	31323
Zero Difference (kPa)	1.08
Resolution (kPa)	0.09
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.84%



Certificate Number
221003-165458-CT

Cone Calibration - Cone Tip

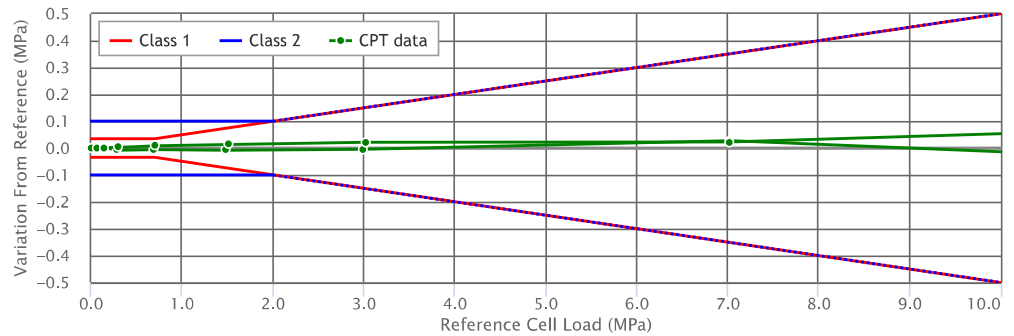
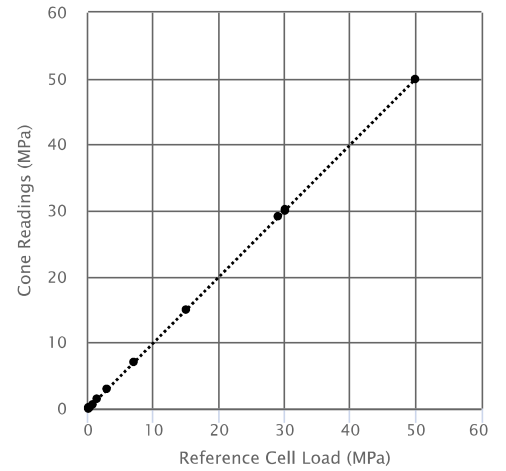
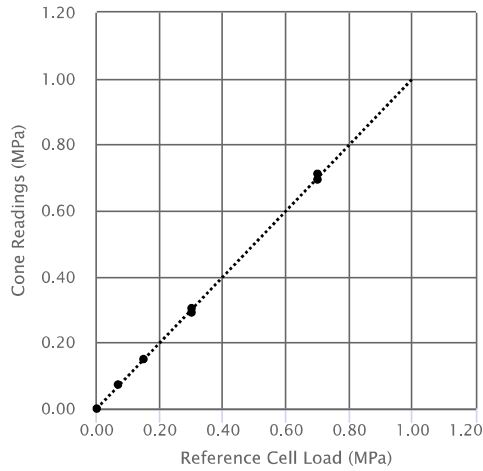


Cone Details

Cone Number	MKJ333
Cone Manufacturer	Pagani
Capacity (MPa)	50
Calibration Date	03-10-2022
Calibrated By	SB
Cone Area (cm ²)	10
Cone Area Ratio	0.8

Zero Readings

Scaling Factor	191.648
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	3941
Final Zero Reading	3941
Zero Difference (kPa)	0.00
Resolution (kPa)	5.22
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.96%



Certificate Number
221003-165458-FS

Cone Calibration - Friction Sleeve

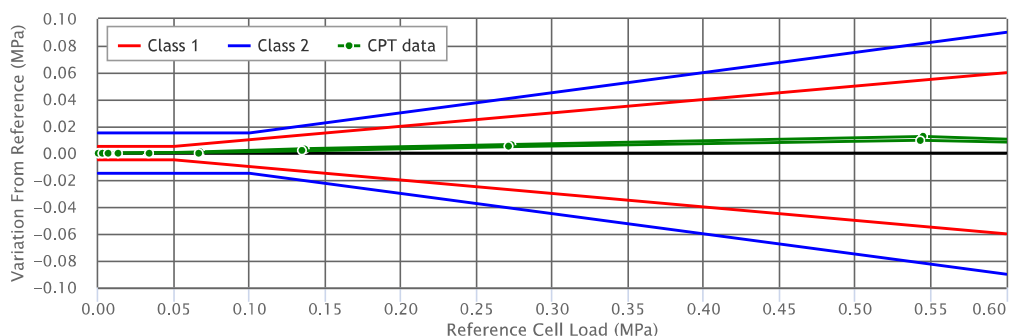
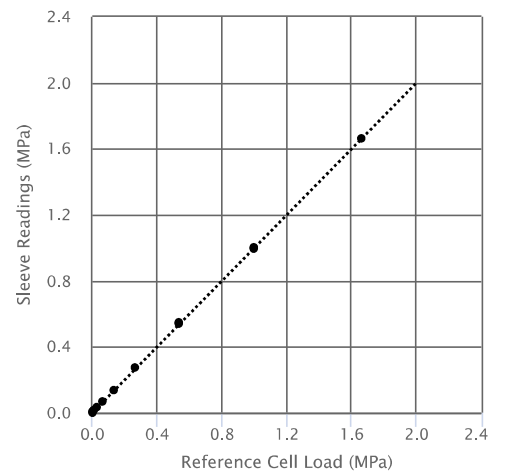
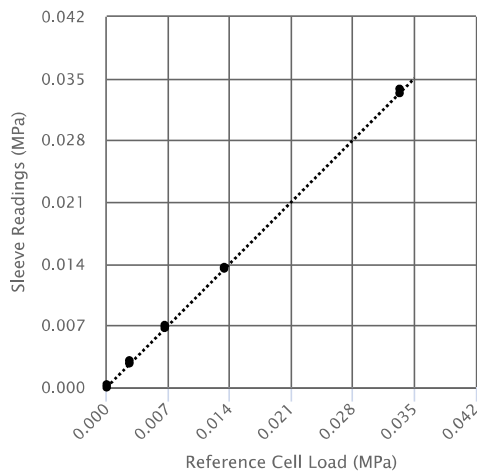


Cone Details

Cone Number	MKJ333
Cone Manufacturer	Pagani
Capacity (MPa)	1.6
Calibration Date	03-10-2022
Calibrated By	SB
Sleeve Area (cm ²)	150

Zero Readings

Scaling Factor	1947.03
Scaling Range (FSO)	0 to 0.1%
Initial Zero Reading	8017
Final Zero Reading	8026
Zero Difference (kPa)	4.62
Resolution (kPa)	0.51
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	100%



Certificate Number
221003-165458-PP

Cone Calibration - Pore Pressure

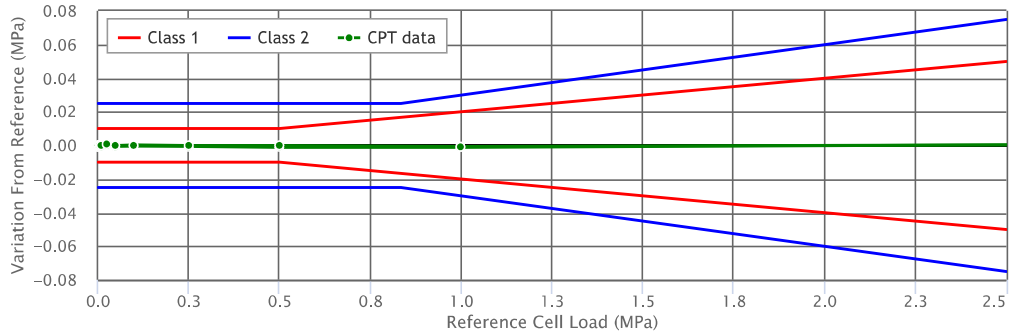
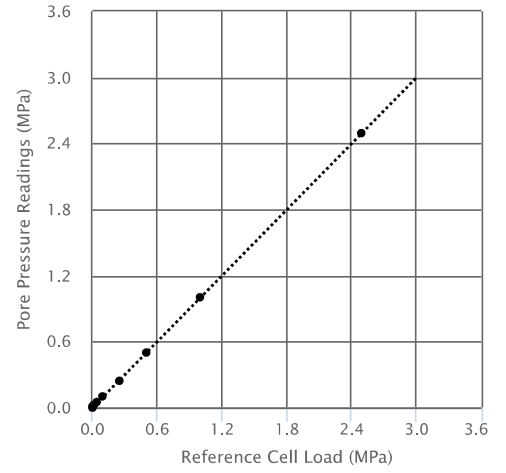
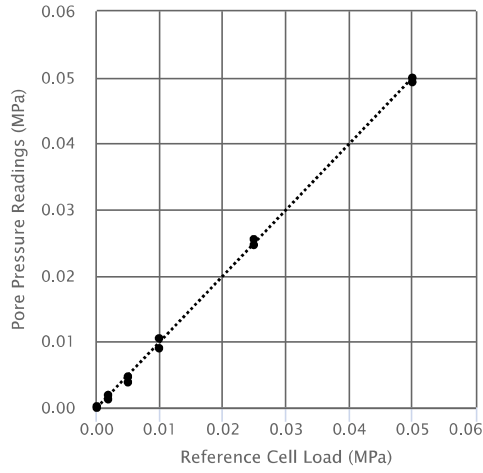


Cone Details

Cone Number	MKJ333
Cone Manufacturer	Pagani
Capacity (MPa)	2.5
Calibration Date	03-10-2022
Calibrated By	SB

Zero Readings

Scaling Factor	16.919
Scaling Range (FSO)	0 to 2.0%
Initial Zero Reading	31832
Final Zero Reading	31837
Zero Difference (kPa)	0.30
Resolution (kPa)	0.06
R ² Full Range (%)	99.99%
R ² Scaling Range (%)	99.84%



Hand-held Shear Vane
Calibration Certificates



Calibration Certificate

Certificate No: 718836.01

Certificate Issued To	Aecom New Zealand Ltd - Auckland		Address	Level 2, Aecom House 8 Mahuhu Crescent Auckland 1010	
Purchase Order No	08084602				
Manufacturer	Simmons Edeco	Model	Pilcon	S/No	DR1980
				Unique ID	
Description	Handheld shear vane with matching blade(s)				
Calibration Date	2/06/2022		Temp During Test	20.0 to 20.4 °C	
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2021), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				
Results					

19 mm Ø Vane Blade

Shear Strength = A × Reading	A (kPa/div)	1.876	Area Ratio	23.7%
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COMMENT : This chart applies to the outer scale of the dial.

Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	0	30	56	60	113	90	169	120	225
2	4	32	60	62	116	92	173		
4	8	34	64	64	120	94	176		
6	11	36	68	66	124	96	180		
8	15	38	71	68	128	98	184		
10	19	40	75	70	131	100	188		
12	23	42	79	72	135	102	191		
14	26	44	83	74	139	104	195		
16	30	46	86	76	143	106	199		
18	34	48	90	78	146	108	203		
20	38	50	94	80	150	110	206		
22	41	52	98	82	154	112	210		
24	45	54	101	84	158	114	214		
26	49	56	105	86	161	116	218		
28	53	58	109	88	165	118	221		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±7.5 kPa. The coverage factor (k) is 2.

Remarks

When received, this equipment was in good condition.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

This certificate has been prepared for the benefit of Aecom New Zealand Ltd - Auckland, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.


This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.

Prepared by




Satnam Singh
Calibration Technician

Checked by



Bernard Kriel
Calibration Technician

Key Technical Person



Bernard Kriel
Calibration Technician



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation



Calibration Certificate

Certificate No: 716826.01

Certificate Issued To	Aecom New Zealand Ltd		Address	Level 2, Aecom House 8 Mahuhu Crescent Auckland 1010	
Purchase Order No	60558831				
Manufacturer	Simmons Edeco	Model	Pilcon	S/No	DR1980
				Unique ID	
Description	Handheld shear vane with matching blade(s)				
Calibration Date	28/06/2021	Temp During Test	19.9 to 20.3 °C		
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2020), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				

Results

19 mm Ø Vane Blade

Shear Strength = A × Reading + B	A (kPa/div)	1.781	B (kPa)	-11.22	Area Ratio	23.8%
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COMMENT : This chart applies to the outer scale of the dial.

Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	-	30	42.2	60	95.6	90	149.1	120	202.5
2	-	32	45.8	62	99.2	92	152.6	122	206.1
4	-	34	49.3	64	102.8	94	156.2	124	209.6
6	-	36	52.9	66	106.3	96	159.8		
8	3.0	38	56.5	68	109.9	98	163.3		
10	6.6	40	60.0	70	113.5	100	166.9		
12	10.2	42	63.6	72	117.0	102	170.5		
14	13.7	44	67.2	74	120.6	104	174.0		
16	17.3	46	70.7	76	124.1	106	177.6		
18	20.8	48	74.3	78	127.7	108	181.1		
20	24.4	50	77.8	80	131.3	110	184.7		
22	28.0	52	81.4	82	134.8	112	188.3		
24	31.5	54	85.0	84	138.4	114	191.8		
26	35.1	56	88.5	86	142.0	116	195.4		
28	38.7	58	92.1	88	145.5	118	199.0		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±6.9 kPa. The coverage factor (k) is 2.

Remarks

When received, this equipment was in good condition. The equipment was adjusted and/or repaired prior to calibration and the recording of measurements. Initial measurements are available on request.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

This certificate has been prepared for the benefit of Aecom New Zealand Ltd, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.

Prepared by

 Annalyse Ryan
Metrologist

Checked by

 Agnelo Vaz
Senior Metrologist

Key Technical Person

 Agnelo Vaz
Senior Metrologist



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation



Calibration Certificate

Certificate No: 715496.01

Certificate issued to	Aecom New Zealand Ltd		Address	Aecom House 8 Mahuhu Crescent Auckland 1010 New Zealand	
Purchase Order No	60604837				
Manufacturer	Geotechnics	Model	Geovane	S/No	734
				Unique ID	
Description	Handheld shear vane & blade(s) with matching serial number(s)				
Calibration Date	7/10/2020		Temp During Test	20±1 °C	
Method	MCC 5.51c.01 (2016) – Handheld Soil Shear Vane Testers; NZGS Guidelines: Guideline for Hand Held Shear Vane Test (2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				

Shear Strength Constant (kPa/div)	1.487	19 mm Ø Blade	Area Ratio	24.7%
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Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)
0	0	30	45	60	89	90	134	120	178
2	3	32	48	62	92	92	137	122	181
4	6	34	51	64	95	94	140	124	184
6	9	36	54	66	98	96	143	126	187
8	12	38	57	68	101	98	146	128	190
10	15	40	59	70	104	100	149	130	193
12	18	42	62	72	107	102	152	132	196
14	21	44	65	74	110	104	155	134	199
16	24	46	68	76	113	106	158	136	202
18	27	48	71	78	116	108	161	138	205
20	30	50	74	80	119	110	164	140	208
22	33	52	77	82	122	112	167		
24	36	54	80	84	125	114	170		
26	39	56	83	86	128	116	172		
28	42	58	86	88	131	118	175		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±4.9 kPa.
The coverage factor (k) is 2.

Remarks

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

Calibrated by

 **Cosmos Misquita**
Calibration Technician

IANZ Authorised Signatory

 **Bernard Kriel**
Calibration Technician

 **IANZ**
ACCREDITED CALIBRATION LABORATORY
All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.



Calibration Certificate

Certificate No: 715457

Certificate issued to	Aecom New Zealand Ltd		Address	Aecom House 8 Mahuhu Crescent Auckland New Zealand	
Purchase Order No	08083048				
Manufacturer	Geotechnics	Model	Geovane	S/No	1179
				Unique ID	
Description	Handheld shear vane & blade(s) with matching serial number(s)				
Calibration Date	1/10/2020		Temp During Test	20±1 °C	
Method	MCC 5.51c.01 (2016) – Handheld Soil Shear Vane Testers; NZGS Guidelines: Guideline for Hand Held Shear Vane Test (2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				

Shear Strength Constant (kPa/div)	1.471	19 mm Ø Blade	Area Ratio	24.9%
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Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)
0	0	30	44	60	88	90	132	120	177
2	3	32	47	62	91	92	135	122	179
4	6	34	50	64	94	94	138	124	182
6	9	36	53	66	97	96	141	126	185
8	12	38	56	68	100	98	144	128	188
10	15	40	59	70	103	100	147	130	191
12	18	42	62	72	106	102	150	132	194
14	21	44	65	74	109	104	153	134	197
16	24	46	68	76	112	106	156	136	200
18	26	48	71	78	115	108	159	138	203
20	29	50	74	80	118	110	162	140	206
22	32	52	76	82	121	112	165		
24	35	54	79	84	124	114	168		
26	38	56	82	86	127	116	171		
28	41	58	85	88	129	118	174		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±8.4 kPa.
The coverage factor (k) is 2.

Remarks

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

Calibrated by

C. Misquita
Cosmos Misquita
Calibration Technician

IANZ Authorised Signatory

B. Kriel
Bernard Kriel
Calibration Technician

IANZ
ACCREDITED CALIBRATION LABORATORY
All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation



Calibration Certificate

Certificate No: 717389

Certificate Issued To	Aecom New Zealand Ltd		Address	Level 2, Aecom House 8 Mahuhu Crescent Auckland 1010	
Purchase Order No					
Manufacturer	Geotechnics	Model	Geovane	S/No	1179
				Unique ID	
Description	Handheld shear vane with matching blade(s)				
Calibration Date	1/10/2021	Temp During Test		19.9 to 20.3 °C	
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2020), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				

Results

19 mm Ø Vane Blade

Shear Strength = A × Reading	A (kPa/div)	1.478	Area Ratio	25.0%
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Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	0.0	30	44.3	60	88.7	90	133.0	120	177.3
2	3.0	32	47.3	62	91.6	92	135.9	122	180.3
4	5.9	34	50.2	64	94.6	94	138.9	124	183.2
6	8.9	36	53.2	66	97.5	96	141.8	126	186.2
8	11.8	38	56.1	68	100.5	98	144.8	128	189.1
10	14.8	40	59.1	70	103.4	100	147.8	130	192.1
12	17.7	42	62.1	72	106.4	102	150.7	132	195.0
14	20.7	44	65.0	74	109.3	104	153.7	134	198.0
16	23.6	46	68.0	76	112.3	106	156.6	136	200.9
18	26.6	48	70.9	78	115.2	108	159.6	138	203.9
20	29.6	50	73.9	80	118.2	110	162.5	140	206.9
22	32.5	52	76.8	82	121.2	112	165.5		
24	35.5	54	79.8	84	124.1	114	168.4		
26	38.4	56	82.7	86	127.1	116	171.4		
28	41.4	58	85.7	88	130.0	118	174.3		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±7.2 kPa. The coverage factor (k) is 2.

Remarks

When received, this equipment was in good condition. The equipment was adjusted and/or repaired prior to calibration and the recording of measurements. Initial measurements are available on request.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

This certificate has been prepared for the benefit of Aecom New Zealand Ltd, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.

Prepared by

 **Herman Wessels**
Calibration Technician

Checked by

 **Bernard Kriel**
Calibration Technician

Key Technical Person

 **Bernard Kriel**
Calibration Technician



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation



Calibration Certificate

Certificate No: 719306

Certificate Issued To	Jacobs New Zealand	Address	Level 2, Carlaw Park 12-16 Nicholls Lane Parnell Auckland		
Purchase Order No	Amrit Rai				
Manufacturer	Geotechnics	Model	Geovane	S/No	1712
Description	Handheld shear vane with matching blade(s)				
Calibration Date	22/08/2022	Temp During Test	19.3 to 19.7 °C		
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2021), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.				

Results

19 mm Ø Vane Blade

Shear Strength = A × Reading	A (kPa/div)	1.450	Area Ratio	23.9%
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Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	0	30	44	60	87	90	131	120	174
2	3	32	46	62	90	92	133	122	177
4	6	34	49	64	93	94	136	124	180
6	9	36	52	66	96	96	139	126	183
8	12	38	55	68	99	98	142	128	186
10	15	40	58	70	102	100	145	130	189
12	17	42	61	72	104	102	148	132	191
14	20	44	64	74	107	104	151	134	194
16	23	46	67	76	110	106	154	136	197
18	26	48	70	78	113	108	157	138	200
20	29	50	73	80	116	110	160	140	203
22	32	52	75	82	119	112	162		
24	35	54	78	84	122	114	165		
26	38	56	81	86	125	116	168		
28	41	58	84	88	128	118	171		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±3.9 kPa. The coverage factor (k) is 2.

Remarks

When received, this equipment was in good condition.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

This certificate has been prepared for the benefit of Jacobs New Zealand, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.

Prepared by

Checked by

Key Technical Person

Asher Norman
Asher Norman
Calibration Technician

A. Vaz
Agnelo Vaz
Senior Metrologist

A. Vaz
Agnelo Vaz
Senior Metrologist



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.



Certificate No: 715878.02

Certificate issued to	Jacobs New Zealand Limited	Address	Level 2, Carlaw Park 12 - 16 Nicholls Lane Parnell Auckland		
Purchase Order No	PU027140				
Manufacturer	Simmons Edeco	Model	Pilcon	S/No	DR2272
				Unique ID	
Description	Handheld shear vane & blade(s) with matching serial number(s)				
Calibration Date	14/12/2020	Temp During Test	20±1 °C		
Method	MCC 5.51c.01 (2016) – Handheld Soil Shear Vane Testers; NZGS Guidelines: Guideline for Hand Held Shear Vane Test (2001) was used as a guide.				
Statement of Performance	The equipment meets the requirements of the method for which it was tested.				

Shear Strength Constant (kPa/div)	1.572	19 mm Ø Blade	Area Ratio	24.6%
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COMMENT : This chart applies to the outer scale of the vane head.

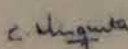
Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)	Reading (divs)	Shear Strength (kPa)
0	0	30	47	60	94	90	141	120	189
2	3	32	50	62	97	92	145	122	192
4	6	34	53	64	101	94	148	124	195
6	9	36	57	66	104	96	151	126	198
8	13	38	60	68	107	98	154	128	201
10	16	40	63	70	110	100	157	130	204
12	19	42	66	72	113	102	160	132	208
14	22	44	69	74	116	104	163		
16	25	46	72	76	119	106	167		
18	28	48	75	78	123	108	170		
20	31	50	79	80	126	110	173		
22	35	52	82	82	129	112	176		
24	38	54	85	84	132	114	179		
26	41	56	88	86	135	116	182		
28	44	58	91	88	138	118	185		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ±3.8 kPa.
The coverage factor (k) is 2.


Remarks

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.

Calibrated by

 Cosmos Misquita
Calibration Technician

IANZ Authorised Signatory

 Bernard Kriel
Calibration Technician

IANZ
ACCREDITED CALIBRATION LABORATORY
All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.



Calibration Certificate

Certificate No: 717473

Certificate Issued To	AECOM New Zealand Ltd		Address		Level 2, AECOM House 8 Mahuhu Crescent Auckland CBD Auckland 1010	
Purchase Order No	08084602, Task Number					
Manufacturer	Geotechnics	Model	Geovane	S/No	2756	
				Unique ID	CRL	
Description	Handheld shear vane with matching blade(s)					
Calibration Date	13/10/2021	Temp During Test		19.9 to 20.3 °C		
Method	MCC 5.51c.01 – Handheld Soil Shear Vane Testers (2020), Guideline for Hand Held Shear Vane Test (NZGS, 2001) was used as a guide.					
Statement of Performance	The equipment meets the requirements of the method for which it was tested.					
Results						

19 mm Ø Vane Blade

Shear Strength = A × Reading	A (kPa/div)	1.577	Area Ratio	24.0%
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Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)	Reading (div)	Shear Strength (kPa)
0	0	30	47	60	95	90	142	120	189
2	3	32	50	62	98	92	145	122	192
4	6	34	54	64	101	94	148	124	196
6	9	36	57	66	104	96	151	126	199
8	13	38	60	68	107	98	155	128	202
10	16	40	63	70	110	100	158	130	205
12	19	42	66	72	114	102	161	132	208
14	22	44	69	74	117	104	164	134	211
16	25	46	73	76	120	106	167	136	214
18	28	48	76	78	123	108	170	138	218
20	32	50	79	80	126	110	173	140	221
22	35	52	82	82	129	112	177		
24	38	54	85	84	132	114	180		
26	41	56	88	86	136	116	183		
28	44	58	91	88	139	118	186		

The expanded uncertainty of measurement, expressed at the 95% confidence level, is ± 6.7 kPa. The coverage factor (k) is 2.

Remarks


When received, this equipment was in good condition.

Measurement results are traceable to the International System of Units (SI), or other recognised references via an unbroken chain of comparisons to the New Zealand National Standards or to the National Standards of other Signatories to the CIPM MRA.


This certificate has been prepared for the benefit of AECOM New Zealand Ltd, with respect to the particular brief given to us and it cannot be relied upon in other contexts or for any other purpose without our prior review and agreement.

This calibration was performed at 1 Hill Street, Onehunga, Auckland, NZ.


Prepared by

 Bernard Kriel
Calibration Technician

Checked by

 Agnelo Vaz
Senior Metrologist

Key Technical Person

 Bernard Kriel
Calibration Technician



All measurements reported herein have been performed in accordance with the laboratory's scope of accreditation.