STRUCTURES TEST REPORT

ST11553-01-01

BATCH TESTING OF IN-GROUND PIT LID TO AS 3996-2006 [2019]

CLIENT
J & D McLennan
P O Box 30087
Lower Hutt
New Zealand

All tests and procedures reported herein, unless indicated, have been performed in accordance with the BRANZ ISO9001 Certification

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LIMITATIONS

The results reported here relate only to the item tested. The sample was tested as supplied.

TERMS AND CONDITIONS

This report is issued in accordance with the Terms and Conditions as detailed and agreed in the BRANZ Services Agreement for this work.

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CONTENTS

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1. OBJECTIVE

This report is a reissue of an older BRANZ TYPE TEST report ST11553-TT [2019] issued on the 8 May 2019.

To undertake a Type Test in accordance with Appendix C of AS 3996-2006 [1] of an In-Ground pit lid. The load classification being sought was Class G in accordance with Table 3.1 of the Standard.

2. DESCRIPTION OF SPECIMENS

The in-ground pit lid assembly was machined steel plate and had the dimensions as shown in Figure 1 to Figure 3. The circular opening (CO) size was 561 mm. The outer dimensions of the actual lid were 655 mm by 655 mm. The openable lid was located centrally with respect to the width of the fixed surround but offset from the longitudinal centre (see Figure 3). The perimeter of the fixed surround was bolted to the test rig so as to be representative of installation. The assembly was one of 22 manufactured on J&D McLennan Job Number 33622.

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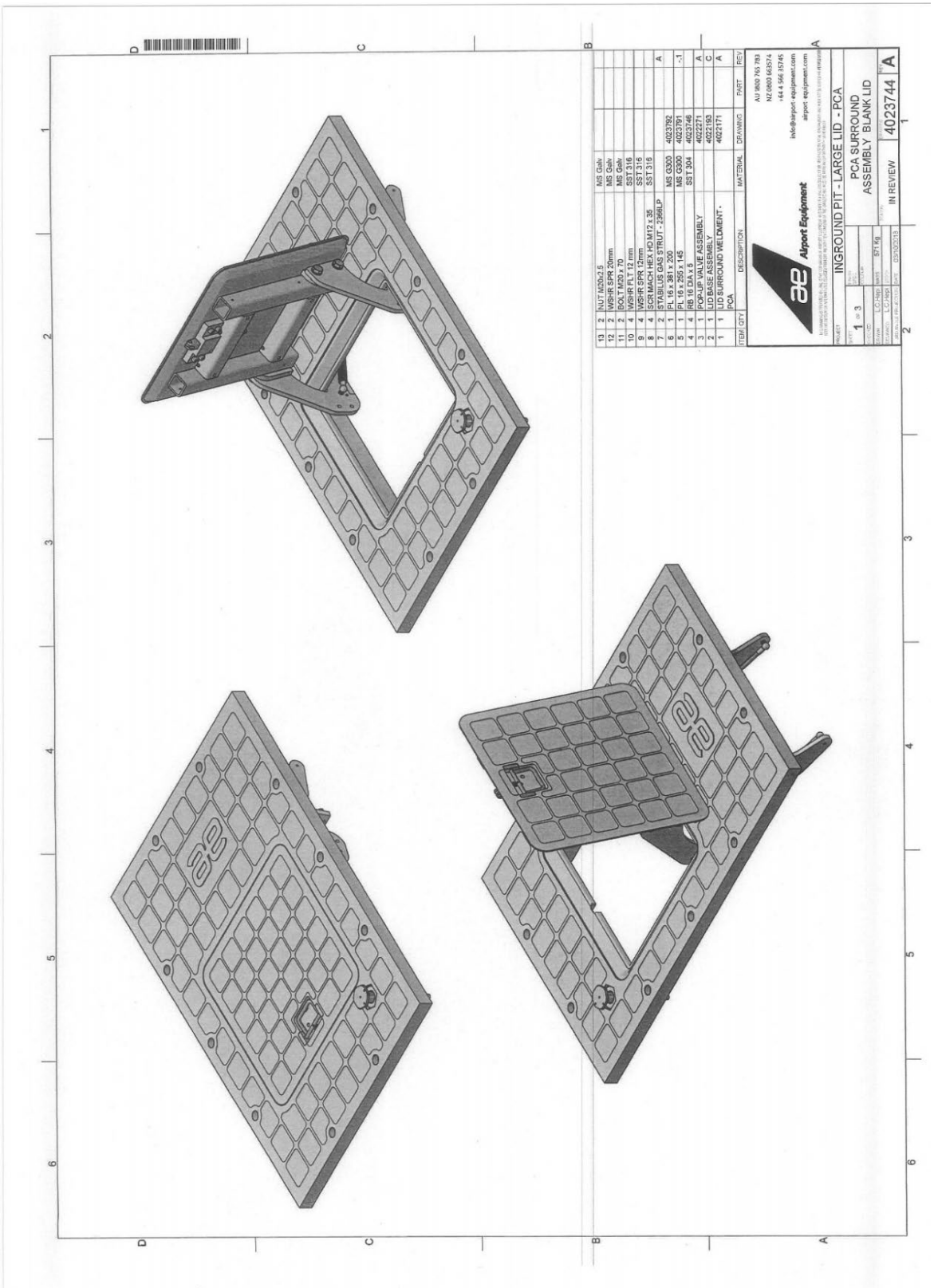

Figure 1. Pit lid assembly (Drawing number 4023744 Sheet 1 of 3) (Drawing supplied by the client)

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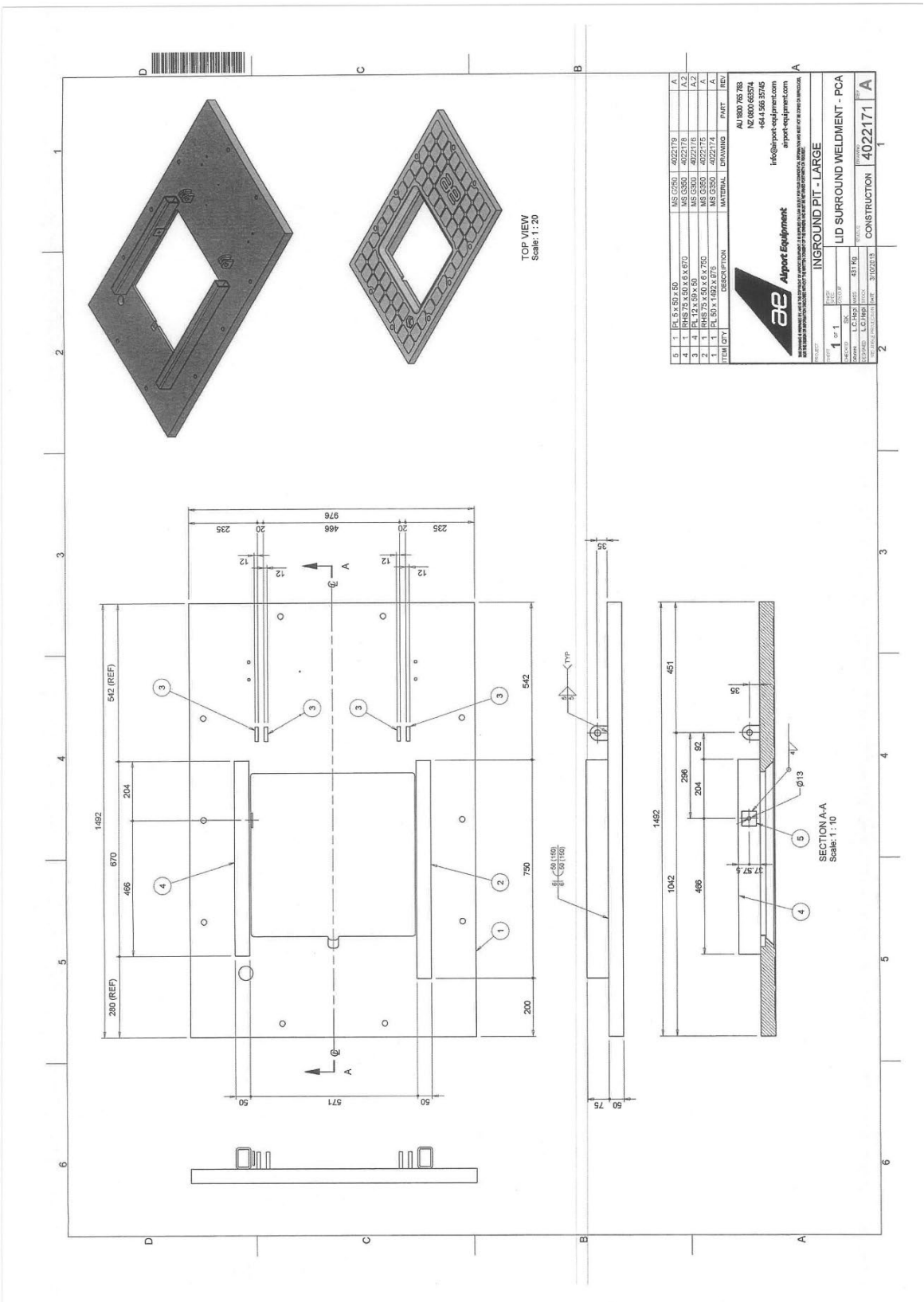

Figure 2. Pit lid assembly (Drawing number 4022171 Sheet 1 of 1) (Drawing supplied by the client)

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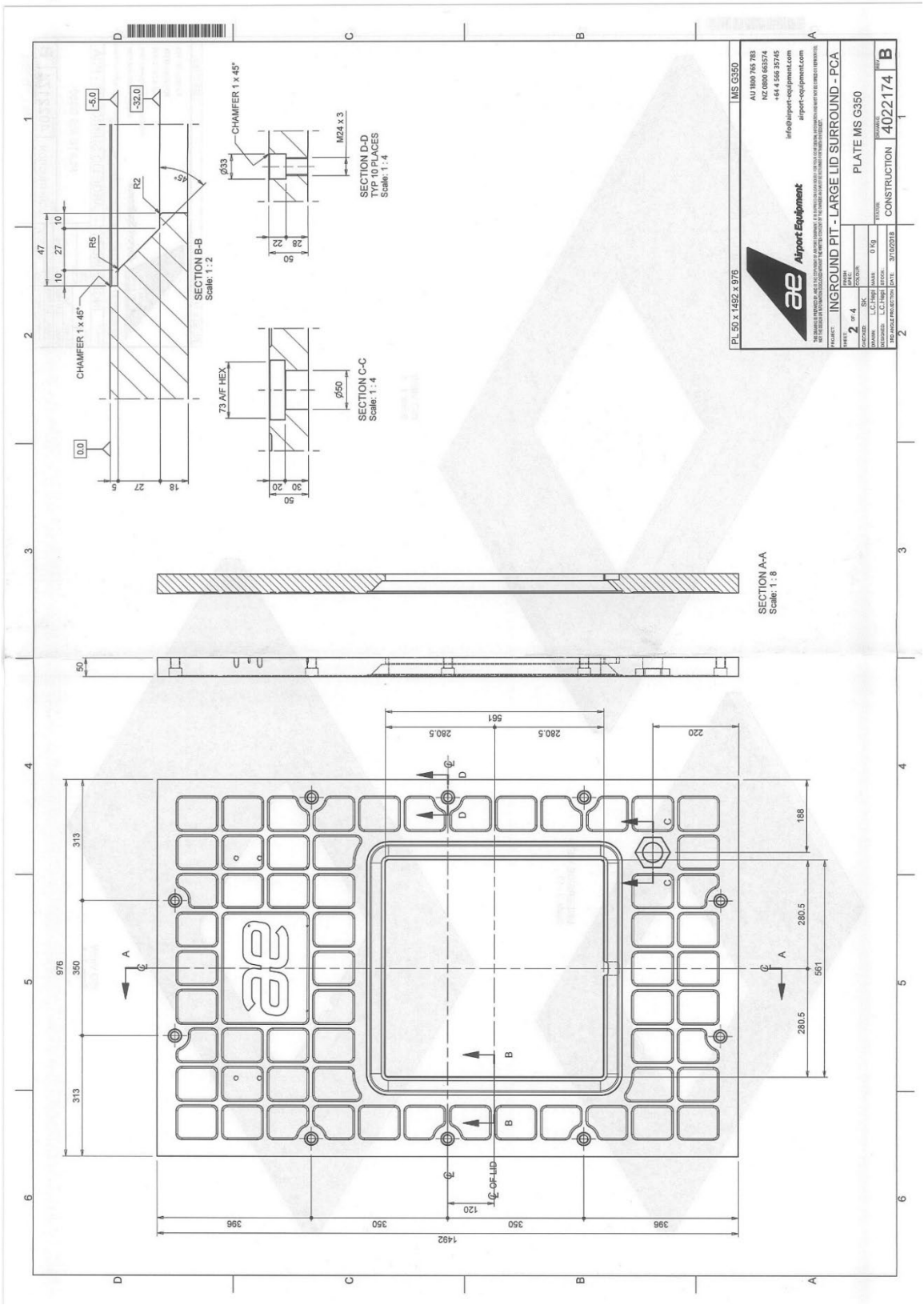

Figure 3. Pit lid (Drawing number 4022174 Sheet 1 of 4) (Drawing supplied by the client)

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3. DESCRIPTION OF TESTING

3.1 Date and location of test

The test was carried out in May 2019, at the premises of J & D McLennan, Lower Hutt, New Zealand.

3.2 Test set-up

The assembled lid and surround were fitted into a steel frame. The frame was constructed with a rectangular base of 300 mm parallel flange channels (300PFC), with a shelf constructed from 70 mm wide x 25 mm thick mild steel plate to accept the outer edge of the lid assembly. On each of the long edges of the rectangular frame, vertical 300PFCs were welded and to these, a top cross beam of two back-to-back 300PFCs was welded to provide a reaction frame.

A view of the specimen installed in the test frame is presented in Figure 4.

Figure 4. View of the specimen installed in the test frame

Load was applied to the top of the lid assembly using a 100 tonne capacity ram and hand pump. The load was applied through a rigid 250 mm diameter steel test block onto a 250 mm x 250 mm x 25 mm thick section of structural plywood. The load was measured with a PT LPCH loadcell (Serial number 1366003) having a range of 100 tonne. The loadcell was connected to a PT 20X-F indicator (Serial number 3322448). The system of loadcell and indicator was calibrated on 6 November 2018 by Sensortronic Scales Ltd. While not stated on the certificate, Sensortronic Scales has separately confirmed that the loadcell and indicator achieved a Class 1 rating in accordance with International Standard EN ISO 7500-1.2004 [2] (calibration certificate appended). The deflection of the geometric centre of the lid was measured with a 10 mm displacement potentiometer for the serviceability load tests. Because the test was a batch test there was no requirement to load the lid to the ultimate load. The potentiometer outputs were captured by a Labview data logging program on a laptop computer

and displayed on the computer screen. The potentiometers and logging equipment were calibrated to produce an output accurate to 0.1 mm.

3.3 Test procedure

The assembly was loaded at the geometric centre of the assembly in accordance with clauses C4.3, and C4.5 to C4.6 of AS 3996-2006 [1]. Note that this meant that the load was applied in an offset position with respect to the centre of the openable lid.

An initial reading from the displacement potentiometer was made before any load was applied. Load was then applied at a rate of between 1 kN/s and 5 kN/s until the load reached 600 kN (61.16 tonne). The load was maintained for 5 seconds and a second displacement reading was taken at this load. This process was repeated four more times.

4. RESULTS

The displacements recorded during the test are presented in Table 1. The permanent set (differential displacement) after five serviceability cycles was determined to be 0.2 mm.

Table 1. Displacements recorded during the tests

Stage of test	Displacement record (mm)	Differential displacement (mm)
Before loading	0	
600 kN load (First cycle)	6.2	
Unloaded	0.1	
600 kN load (Second cycle)	6.2	
Unloaded	0.1	
600 kN load (Third cycle)	6.2	
Unloaded	0.1	
600 kN load (Fourth cycle)	6.3	
Unloaded	0.2	
600 kN load (Fifth cycle)	6.2	
Unloaded	0.2	**0.2**

5. CONCLUSION

AS 3996-2006 requires that the maximum permanent set for a lid with CO >500 mm is CO/500 = 1.1 mm. The maximum recorded permanent set in the test was 0.2 mm. AS 3996-2006 also requires that the maximum deflection does not exceed CO/45 (= 561/45 = 12.5 mm) in the cycles to the serviceability load. The maximum deflection recorded in the serviceability

test was 6.3 mm. The in-ground pit lid therefore satisfies the requirements of Table 4.2 of AS 3996-2006 [1] for a Class G lid when tested in accordance with Appendix C of that Standard.

Since testing, the AS 3996:2006 [1] has been superseded with AS 3996:2019 [3]. The testing methods used in this report and relevant compliance requirements set out above have not changed between the two versions of AS 3996. The client has confirmed that since testing there has been no change to the product [4]. Therefore, it can be concluded that the testing and results are compliant with the current standard AS 3996:2019 [3].

6. REFERENCES

[1] AS 3996:2006 Access covers and grates, Standards Australia, Sydney, Australia.

[2] International Organisation for Standardisation (ISO). 2004. ISO 7500:2004 Metallic Materials – Verification of Static Uniaxial Testing Machines, Part 1: Tension/Compression Testing Machines – Verification and Calibration of the Force-Measuring System. ISO, Geneva, Switzerland.

[3] AS 3996:2019 Access covers and grates, Standards Australia, Sydney, Australia.

[4] Letter dated 9th December 2025 from J&D McLennan Engineering.

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7. APPENDIX

Sensortronic Scales
www.sensortronicscales.co.nz
0800 4 SCALES

CERTIFICATE OF CALIBRATION

Loadcell and Indicator

IANZ Laboratory Accreditation Number: 1107

Certificate must not be reproduced except in full.

Customer:	J & D McLennan Engineers	*Certificate Number:*	H18689
Address:	2-12 Rutherford Street	*Date of Calibration:*	6/11/2018
	Lower Hutt 5040	*Issuing Branch:*	Hamilton
		Purchase Order:	Sasidhar
Make / Model:	PT 200X-F	*ID:*	N/A
Capacity:	100000 kg x 5 kg	*Temp:*	20 °C ± 1 °C
Serial Number:	1366003		

↓↓↓↓↓↓↓↓↓↓↓↓COMPRESSION↓↓↓↓↓↓↓↓↓↓↓↓			
Setpoint (kg)	**Displayed Average (kg)**	**Correction (kg)**	**Uncertainty (kg)**
10000	10015	-15	39
20000	20015	-15	78
30000	30000	0	117
40000	39870	130	156
50000	49850	150	195
60000	59905	95	234
70000	69985	15	273
80000	79950	50	312
90000	89875	125	351
100000	99990	10	390
↓↓↓↓↓↓↓↓↓↓↓↓COMPRESSION↓↓↓↓↓↓↓↓↓↓↓↓			
Setpoint (kg)	**Displayed Average (kg)**	**Correction (kg)**	**Uncertainty (kg)**

Test Frame Used
100T Humes Crusher

Proving Equipment Used & Expiry Dates
Systec Cert: NZ.AC/3469-A-3 Due: 19/02/21

Uncertainty figures quoted are based on 95% confidence level where k=2.2

Calibrated in accordance with Section 7D of Laboratory Quality Management Manual to ISO 17025:2005

Location and environment was good, calibration is within scope of accreditation, results are traceable to the International System of Units (SI).

ilac-MRA IANZ ACCREDITED CALIBRATION LABORATORY ACCREDITATION Nº: 1107

Aaron Pell
IANZ Signatory

Levi Newson
Calibrated By

ISO 9001 BUREAU VERITAS Certification

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