TITLE
Project Olympus WORKING PILE LOAD TEST REPORT WTP04-No024 Asite Ref: LCY11-KTB-XX-XX-RP-C-00043 Revision: P01

Comment
Keltbray have reviewed the pile settlements in the attached report and these are in line with our design assumptions and comply with the project specification requirements

SOCOTEC UK Limited
Wass Way
Durham Lane Industrial Park
Stockton-on-Tees
TS16 0RG

Pile Load Test Report

SOC-FNDS-MLT-25-099.1

Contract Information

SOCOTEC UK Reference	FNDS-25-099	*Contract Reference*	BE0046
Client	Keltbray	*Client Contact*	Graham Smith
Client Address	St Andrew's House Portsmouth Road Esher Surrey KT10 9TA		
Site Address	54A North Woolwich Road Silvertown London E16 2AA		

Abstract

This report describes the load testing carried out by SOCOTEC UK at Project Olympus on WTP4-NO024. The data presented in this report represents a summary of the measured readings due to the volume obtained. Full data records can be provided upon request.

Summary

Increment	Load (kN)	Maximum Disp. (mm)	Residual Disp. (mm)
100% DVL	2405	4.02	0.44
100% DVL + 50% F_{REP}	3607	9.22	3.14

Revision History

Revision	Report Date	Issue Date	Author	Verifier	Revision Details
1	01/05/2025	01/05/2025	DM	MP	Initial Document

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Introduction

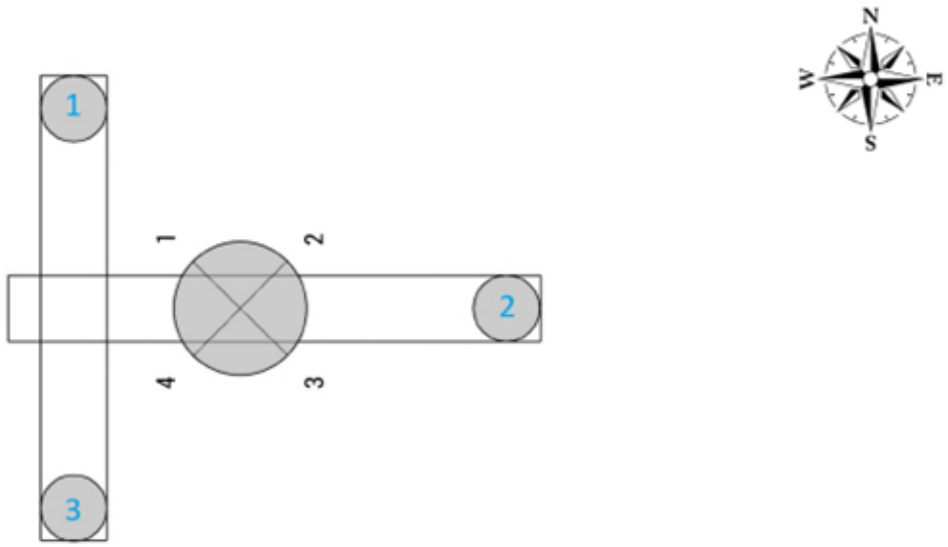
SOCOTEC UK were employed by Keltbray to undertake a Maintained Load Test at Project Olympus between the dates of 28/04/2025 and 29/04/2025. A 600 mm diameter pile designated WTP4-NO024 was installed to a depth of 29.21 m by Keltbray on 03/04/2025 using a rotary bored method. The pile was tested in vertical compression to a maximum load of 3,607 kN following ICE SPERW 3rd Edition.

SOCOTEC UK utilised an S450 reaction frame built above the test pile. Load was applied to the test pile using an 8800 kN hydraulic actuator and monitored using a 7500 kN strain gauge load cell calibrated with full traceability to national standards. Load control was performed using SOCOTEC UK's automated system, which maintains the applied load within 5 kN of the target.

Instrumentation – Pile Head

Pile displacement was monitored using four linear potentiometric displacement transducers mounted on a reference frame and connected to a Campbell Scientific CR1000 data logger.

Figure 1 – Pile Head Instrumentation Layout



Testing Schedule

The test was performed as described in ICE SPERW 3rd Edition following multiple loading cycles to 100% DVL + 50% F_{REP}. The loading increments are shown in Table 1.

DVL = 2,405 kN
F_{REP} = 2,404 kN

Table 1 – Loading Increments

Increment	DVL %	F_{REP} %	Load (kN)	Minimum Hold Time (min)
1	25	0	601	30
2	50	0	1203	30
3	75	0	1804	30
4	100	0	2405	360
5	75	0	1804	10
6	50	0	1203	10
7	25	0	601	10
8	0	0	0	60
9	100	0	2405	60
10	100	25	3006	60
11	100	50	3607	360
12	100	25	3006	10
13	100	0	2405	10
14	75	0	1804	10
15	50	0	1203	10
16	25	0	601	10
17	0	0	0	60

Summary of Results – Pile Head

Table 2 – Pile Head Results Summary

Time	Increment	Load (kN)	Average Disp. (mm)	Disp. 1 (mm)	Disp. 2 (mm)	Disp. 3 (mm)	Disp. 4 (mm)	Temp. (°C)
28/04/2025 13:05	0% DVL	0	0.00	0.00	0.00	0.00	0.00	24.5
28/04/2025 13:09	25% DVL Start	603	0.35	0.36	0.35	0.38	0.30	24.6
28/04/2025 14:05	25% DVL End	601	0.65	0.67	0.67	0.66	0.59	25.3
28/04/2025 14:07	50% DVL Start	1198	1.37	1.41	1.41	1.37	1.31	25.3
28/04/2025 15:00	50% DVL End	1201	1.65	1.69	1.68	1.65	1.59	25.4
28/04/2025 15:03	75% DVL Start	1798	2.39	2.37	2.45	2.45	2.31	25.5
28/04/2025 15:55	75% DVL End	1803	2.77	2.74	2.88	2.82	2.65	25.2
28/04/2025 15:58	100% DVL Start	2402	3.40	3.37	3.58	3.45	3.19	25.2
28/04/2025 22:00	100% DVL End	2403	4.02	4.00	4.14	4.06	3.88	16.0
28/04/2025 22:01	75% DVL Start	1815	3.51	3.47	3.59	3.58	3.39	16.0
28/04/2025 22:15	75% DVL End	1810	3.41	3.38	3.49	3.48	3.30	15.8
28/04/2025 22:16	50% DVL Start	1211	2.64	2.59	2.74	2.67	2.57	15.7
28/04/2025 22:30	50% DVL End	1211	2.59	2.53	2.68	2.61	2.53	15.5
28/04/2025 22:32	25% DVL Start	611	1.71	1.64	1.80	1.76	1.64	15.5
28/04/2025 22:45	25% DVL End	610	1.63	1.55	1.72	1.67	1.56	15.3
28/04/2025 22:51	0% DVL Start	0	0.61	0.51	0.73	0.62	0.58	15.2
29/04/2025 00:10	0% DVL End	0	0.44	0.33	0.56	0.44	0.43	14.2
29/04/2025 00:22	100% DVL Start	2400	3.98	3.96	4.11	4.03	3.85	14.0
29/04/2025 01:30	100% DVL End	2401	4.18	4.16	4.32	4.22	4.03	12.9
29/04/2025 01:34	100% DVL + 25% F_{REP} Start	3001	5.23	5.18	5.36	5.29	5.07	12.8
29/04/2025 04:05	100% DVL + 25% F_{REP} End	3004	6.05	6.00	6.15	6.11	5.94	11.0

Time	Increment	Load (kN)	Average Disp. (mm)	Disp. 1 (mm)	Disp. 2 (mm)	Disp. 3 (mm)	Disp. 4 (mm)	Temp. (°C)
29/04/2025 04:10	100% DVL + 50% F_{REP} Start	3603	7.16	7.10	7.25	7.20	7.09	10.9
29/04/2025 10:40	100% DVL + 50% F_{REP} End	3604	9.22	9.38	9.19	9.19	9.12	20.3
29/04/2025 10:44	100% DVL + 25% F_{REP} Start	3012	8.80	8.99	8.73	8.73	8.75	20.4
29/04/2025 10:55	100% DVL + 25% F_{REP} End	3014	8.67	8.84	8.61	8.59	8.63	20.7
29/04/2025 10:59	100% DVL Start	2414	7.92	8.09	7.85	7.86	7.89	20.8
29/04/2025 11:15	100% DVL End	2414	7.85	8.00	7.81	7.79	7.81	21.1
29/04/2025 11:16	75% DVL Start	1811	6.98	7.12	6.93	6.92	6.94	21.1
29/04/2025 11:30	75% DVL End	1812	6.83	6.96	6.83	6.78	6.74	21.3
29/04/2025 11:31	50% DVL Start	1212	5.88	6.02	5.87	5.85	5.78	21.4
29/04/2025 11:45	50% DVL End	1212	5.73	5.85	5.77	5.71	5.59	21.6
29/04/2025 11:47	25% DVL Start	610	4.68	4.82	4.71	4.63	4.56	21.7
29/04/2025 12:00	25% DVL End	610	4.59	4.73	4.62	4.54	4.45	21.9
29/04/2025 12:07	0% DVL Start	0	3.38	3.52	3.40	3.33	3.27	22.1
29/04/2025 13:30	0% DVL End	0	3.14	3.33	3.16	3.09	3.00	23.1

Figure 2 – Load and Displacement vs. Time

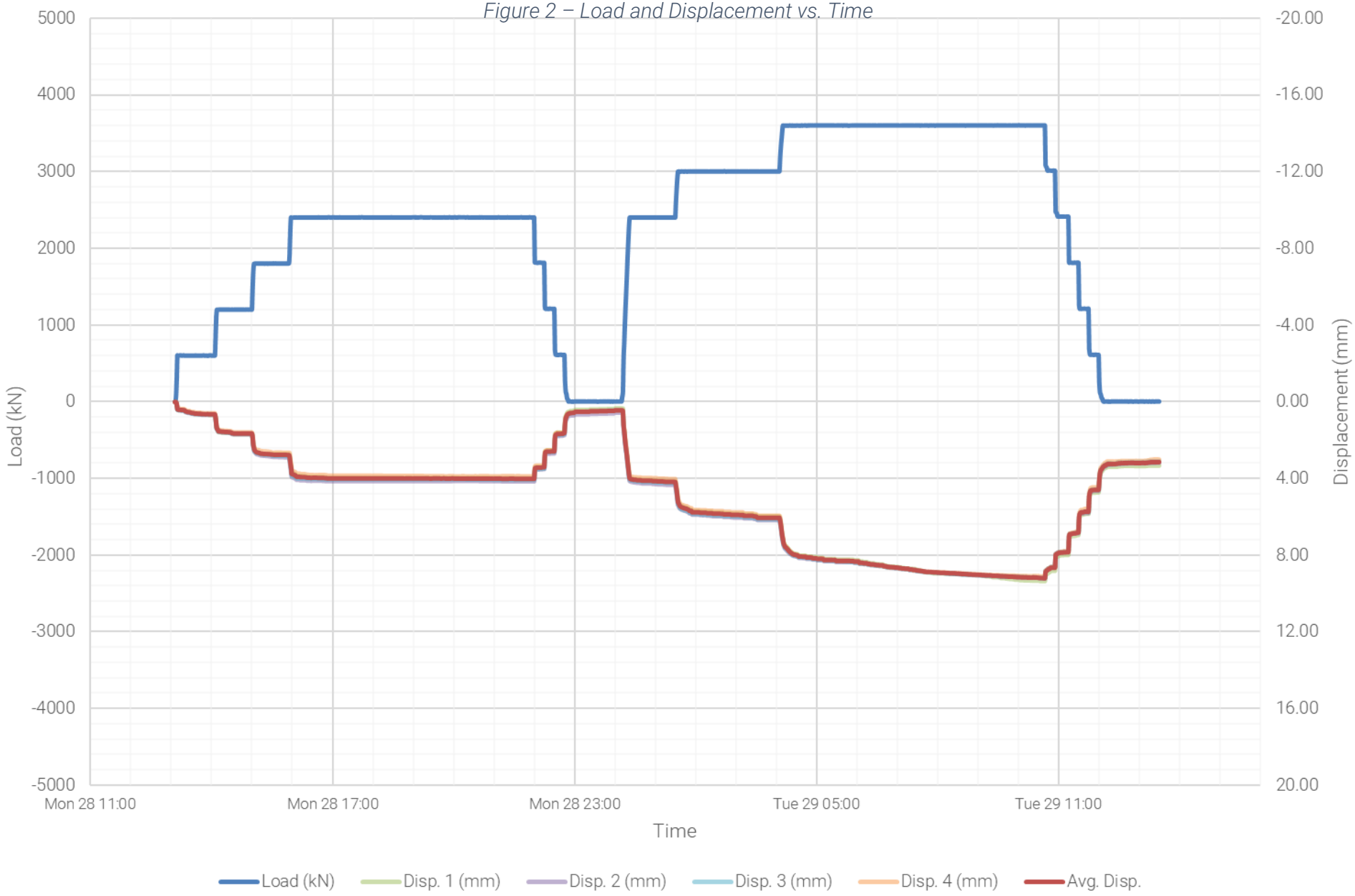
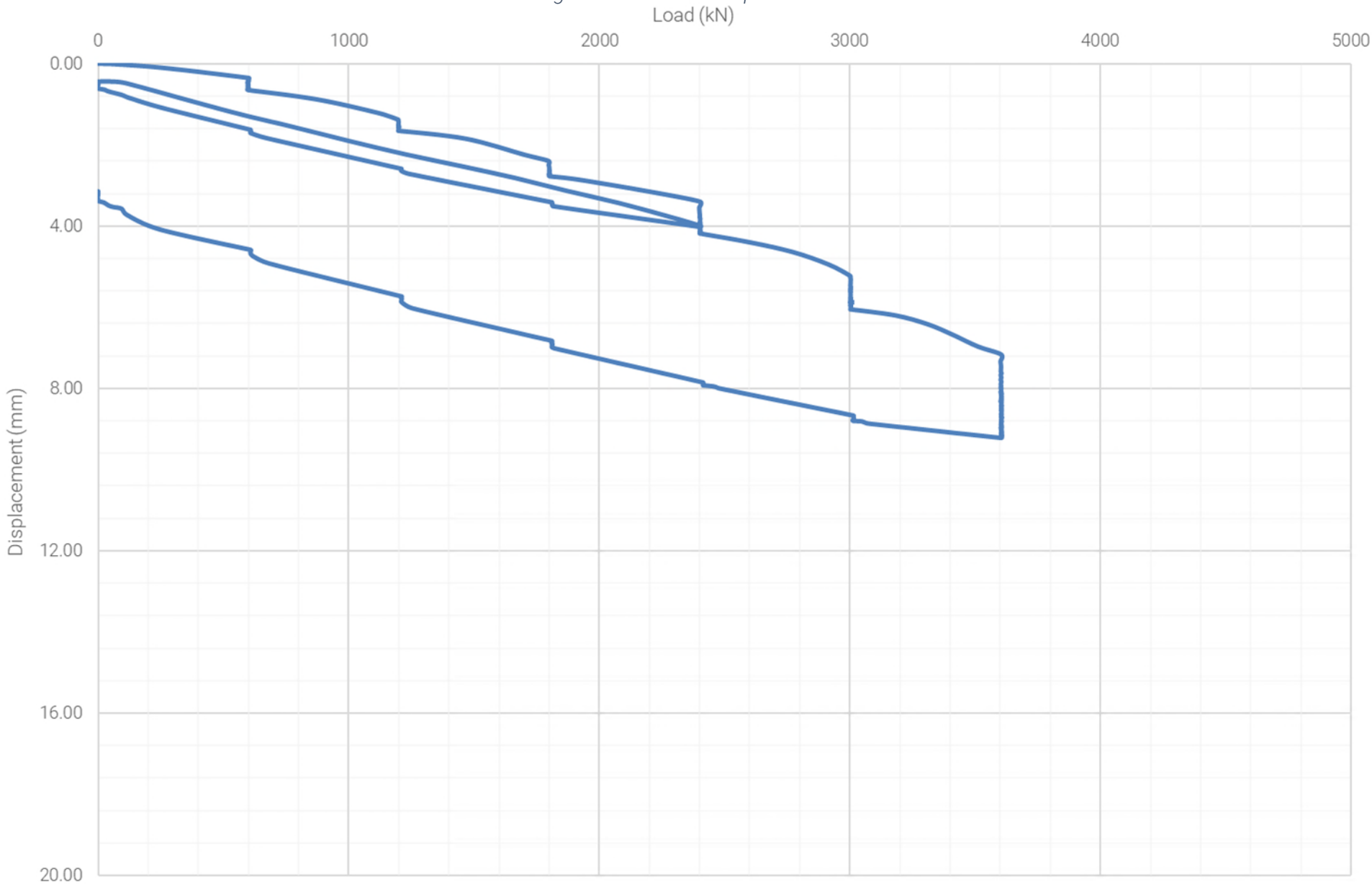


Figure 3 – Load vs. Displacement



Appendix A. – Soil Strata

Material	Depth (m)
Made Ground	3.0
Alluvium/Peat	5.0
RTG	10.5
London Clay	16.5
Harwich Formation	17.5
Lambeth Sand/Gravel	23.0
Lambeth Clay	27.0
Thanet Sands	27.0+

These details are provided by Keltbray.

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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS90

Certificate Number: LCC-5222

Transducer Serial: PMC755 **Equipment Type:** Load Cell, Spherical Seat Platen

Digital Readout: Master Logger - Stockton **Manufacturer:** Woodland Weighing Systems

Date of Calibration: 17/04/2025 **Date of Issue:** 17/04/2025 **Valid Until:** 17/04/2026

CALIBRATION DATA

Reference Load (kN)	Indicated Load (kN) Run 1	Run 2	Run 3	Average (kN)	Uncertainty %
0	0	0	0	0	0
750	743	744	745	744	1.14
1,500	1,501	1,504	1,506	1,504	1.15
2,250	2,258	2,254	2,258	2,257	1.14
3,000	3,010	3,008	3,011	3,010	1.13
3,750	3,757	3,755	3,759	3,757	1.13
4,500	4,506	4,504	4,510	4,507	1.13
5,250	5,251	5,249	5,252	5,251	1.13
6,000	5,995	5,997	6,001	5,998	1.13
6,750	6,742	6,741	6,743	6,742	1.13
7,500	7,488	7,486	7,492	7,489	1.13
0	2	3	6	4	0

Start Temperature: 18.0°C End Temperature: 18.2°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Load	PMC 1501	15 MN Master Load Cell	14/03/2027
Temperature	DT-19	Digital Thermometer	31/08/2025

FACTOR: 3499

OFFSET: 25.08

Calibrated by: Ben Mulroy

Approved by: Michael Plummer

CONTROLLED DOCUMENT PMC90T .Results relate only to the item being calibrated

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Calibration of measurement equipment is not included in the schedule of accreditation for UKAS laboratory number 0001.

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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS91

Certificate Number: DTC-7411

Transducer Serial: TLP002 **Equipment Type:** Linear Potentiometric Displacement Transducer

Digital Readout: 20103 **Manufacturer:** Penny & Giles

Date of Calibration: 08/01/2025 **Date of Issue:** 08/01/2025 **Valid Until:** 08/01/2026

CALIBRATION DATA

Reference Disp.(mm)	Indicated Disp. (mm) Run 1	Run 2	Run 3	Average (mm)	Uncertainty (mm)
0.00	0.00	0.00	0.00	0.00	0.00
1.00	1.00	0.99	0.99	0.99	0.00
5.00	4.98	4.97	4.97	4.97	0.00
10.00	9.99	9.99	9.99	9.99	0.00
15.00	15.01	15.01	15.01	15.01	0.00
20.00	19.99	19.99	19.99	19.99	0.00
30.00	30.03	30.03	30.02	30.03	0.00
40.00	40.05	40.04	40.05	40.05	0.00
30.00	30.02	30.02	30.03	30.02	0.00
20.00	19.98	19.99	19.98	19.98	0.00
15.00	15.01	15.00	15.00	15.00	0.00
10.00	9.99	9.99	9.99	9.99	0.00
5.00	4.97	4.97	4.97	4.97	0.00
1.00	0.99	0.99	0.99	0.99	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Start Temperature: 20.1°C End Temperature: 20.3°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Displacement	M3	50 mm Digital Micrometer	12/12/2025
Temperature	DT-19	Digital Thermometer	31/08/2025

FACTOR: 49.6916

OFFSET: 0

Calibrated by: John Gaynor

Approved by: Michael Plummer

CONTROLLED DOCUMENT PMC91T Results relate only to the item being calibrated

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. Calibration of measurement equipment is not included in the schedule of accreditation for UKAS laboratory number 0001.

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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS91

Certificate Number: DTC-7453

Transducer Serial: TLP028 **Equipment Type:** Linear Potentiometric Displacement Transducer

Digital Readout: 13653 **Manufacturer:** Penny & Giles

Date of Calibration: 10/04/2025 **Date of Issue:** 10/04/2025 **Valid Until:** 10/04/2026

CALIBRATION DATA

Reference Disp.(mm)	Indicated Disp. (mm) Run 1	Run 2	Run 3	Average (mm)	Uncertainty (mm)
0.00	0.00	0.00	0.00	0.00	0.00
1.00	1.00	0.99	0.99	0.99	0.00
5.00	5.01	5.01	5.01	5.01	0.00
10.00	10.00	10.00	10.00	10.00	0.00
15.00	15.05	15.05	15.05	15.05	0.00
20.00	20.04	20.04	20.04	20.04	0.00
30.00	30.05	30.04	30.04	30.04	0.00
40.00	39.98	39.99	39.99	39.99	0.00
30.00	30.05	30.06	30.06	30.06	0.00
20.00	20.04	20.04	20.04	20.04	0.00
15.00	15.05	15.05	15.05	15.05	0.00
10.00	10.00	10.00	10.00	10.00	0.00
5.00	5.01	5.01	5.02	5.01	0.00
1.00	0.99	1.00	1.00	1.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Start Temperature: 20.2°C End Temperature: 20.6°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Displacement	M4	50 mm Digital Micrometer	27/09/2025
Temperature	70230	Digital Thermometer	28/10/2025

FACTOR: 49.6944

OFFSET: 0

Calibrated by: Stephen Williams

Approved by: Michael Plummer

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Calibration of measurement equipment is not included in the schedule of accreditation for UKAS laboratory number 0001.

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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS91

Certificate Number: DTC-7371

Transducer Serial: TLP040 **Equipment Type:** Linear Potentiometric Displacement Transducer

Digital Readout: PMC1843 / 20102 **Manufacturer:** Penny & Giles

Date of Calibration: 08/08/2024 **Date of Issue:** 08/08/2024 **Valid Until:** 08/08/2025

CALIBRATION DATA

Reference Disp.(mm)	Indicated Disp. (mm) Run 1	Run 2	Run 3	Average (mm)	Uncertainty (mm)
0.00	0.00	0.00	0.00	0.00	0.01
1.00	1.03	1.03	1.03	1.03	0.01
5.00	5.02	5.02	5.02	5.02	0.01
10.00	9.97	9.97	9.97	9.97	0.01
15.00	14.95	14.95	14.95	14.95	0.00
20.00	20.02	20.01	20.01	20.01	0.01
30.00	30.00	30.00	30.00	30.00	0.01
40.00	39.98	39.98	39.98	39.98	0.01
30.00	30.00	29.99	29.99	29.99	0.01
20.00	20.02	20.02	20.02	20.02	0.01
15.00	14.95	14.95	14.95	14.95	0.00
10.00	9.98	9.98	9.98	9.98	0.01
5.00	5.03	5.03	5.03	5.03	0.01
1.00	1.05	1.04	1.04	1.04	0.01
0.00	0.00	0.00	0.00	0.00	0.01

Start Temperature: 19.9°C End Temperature: 19.6°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Displacement	M3	Digital Micrometer - 50 mm	11/12/2024
Temperature	DT-19	Digital Thermometer	31/08/2025

FACTOR: 49.9215

OFFSET: 0

Calibrated by: Stephen Williams

Approved by: Michael Plummer

CONTROLLED DOCUMENT PMC91T Results relate only to the item being calibrated

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. Calibration of measurement equipment is not included in the schedule of accreditation for UKAS laboratory number 0001.

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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS91

Certificate Number: DTC-7449

Transducer Serial: TLP051 **Equipment Type:** Linear Potentiometric Displacement Transducer

Digital Readout: 13653 **Manufacturer:** Penny & Giles

Date of Calibration: 09/04/2025 **Date of Issue:** 09/04/2025 **Valid Until:** 09/04/2026

CALIBRATION DATA

Reference Disp.(mm)	Indicated Disp. (mm) Run 1	Run 2	Run 3	Average (mm)	Uncertainty (mm)
0.00	0.00	0.00	0.00	0.00	0.00
1.00	0.99	0.99	0.99	0.99	0.00
5.00	5.01	5.01	5.01	5.01	0.00
10.00	9.99	9.99	9.99	9.99	0.00
15.00	14.97	14.97	14.97	14.97	0.00
20.00	19.95	19.96	19.95	19.95	0.00
30.00	30.00	30.00	30.00	30.00	0.00
40.00	39.97	39.97	39.97	39.97	0.00
30.00	30.00	30.00	30.00	30.00	0.00
20.00	19.95	19.96	19.96	19.96	0.00
15.00	14.97	14.97	14.97	14.97	0.00
10.00	9.99	9.99	9.99	9.99	0.00
5.00	5.01	5.01	5.01	5.01	0.00
1.00	0.99	0.99	0.99	0.99	0.00
0.00	0.00	0.00	0.00	0.00	0.00

Start Temperature: 20.50°C End Temperature: 20.5°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Displacement	M4	50 mm Digital Micrometer	27/09/2025
Temperature	70230	Digital Thermometer	28/10/2025

FACTOR: 49.7206

OFFSET: 0

Calibrated by: Stephen Williams

Approved by: Michael Plummer

CONTROLLED DOCUMENT PMC91T Results relate only to the item being calibrated

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. Calibration of measurement equipment is not included in the schedule of accreditation for UKAS laboratory number 0001.