TITLE
Project Olympus WORKING PILE LOAD TEST REPORT WTP02-No113 Asite Ref: LCY11-KTB-XX-XX-RP-C-00042 Rev: 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

Pile Load Test Report

SOC-FNDS-MLT-25-098.1

Contract Information

SOCOTEC UK Reference	FNDS-25-098	*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 WTP2-no113. 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	2421	3.22	0.27
100% DVL + 50% F_{REP}	3629	6.68	1.28

Revision History

Revision	Report Date	Issue Date	Author	Verifier	Revision Details
1	28/04/2025	28/04/2025	VST	DM	Initial Document

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Introduction

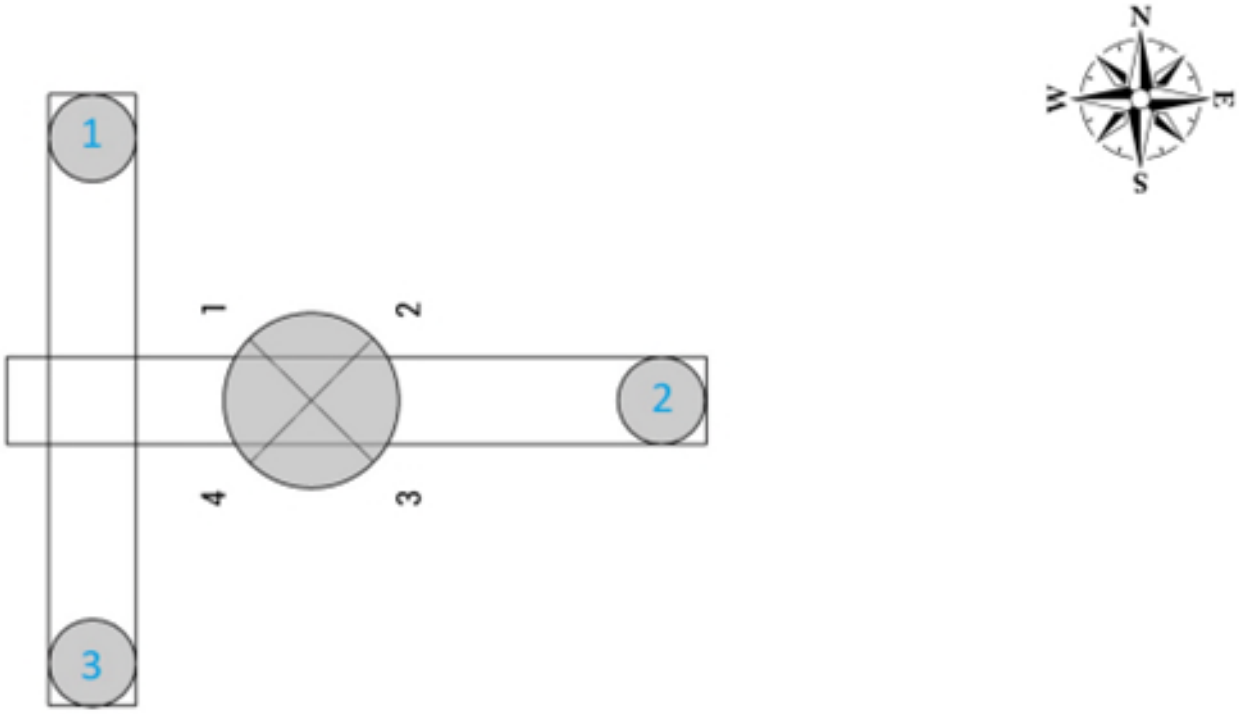
SOCOTEC UK were employed by Keltbray to undertake a Maintained Load Test at Project Olympus between the dates of 24/04/2025 and 25/04/2025. A 600 mm diameter pile designated WTP2-no113 was installed to a depth of 30.51 m by Keltbray on 31/03/2025 using a continuous flight auger method. The pile was tested in vertical compression to a maximum load of 3,629 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 5000 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 = 2,421 kN
F_{REP} = 2,416 kN

Table 1 – Loading Increments

Increment	DVL %	F_{REP} %	Load (kN)	Minimum Hold Time (min)
1	25	0	605	30
2	50	0	1211	30
3	75	0	1816	30
4	100	0	2421	360
5	75	0	1816	10
6	50	0	1211	10
7	25	0	605	10
8	0	0	0	60
9	100	0	2421	60
10	100	25	3025	60
11	100	50	3629	360
12	100	25	3025	10
13	100	0	2421	10
14	75	0	1816	10
15	50	0	1211	10
16	25	0	605	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)
24/04/2025 16:02	0% DVL	0	0.00	0.00	0.00	0.00	0.00	17.7
24/04/2025 16:04	25% DVL Start	602	0.34	0.33	0.40	0.37	0.25	17.7
24/04/2025 16:40	25% DVL End	604	0.44	0.42	0.49	0.48	0.37	18.0
24/04/2025 16:41	50% DVL Start	1202	1.21	1.10	1.25	1.31	1.15	18.0
24/04/2025 17:35	50% DVL End	1211	1.29	1.19	1.34	1.40	1.21	18.1
24/04/2025 17:36	75% DVL Start	1812	1.96	1.82	2.05	2.09	1.87	18.0
24/04/2025 18:10	75% DVL End	1813	2.03	1.91	2.11	2.15	1.95	17.6
24/04/2025 18:12	100% DVL Start	2419	2.73	2.57	2.83	2.90	2.62	17.5
25/04/2025 00:15	100% DVL End	2419	3.22	3.03	3.26	3.39	3.20	9.3
25/04/2025 00:16	75% DVL Start	1825	2.82	2.65	2.83	2.95	2.84	9.3
25/04/2025 00:30	75% DVL End	1825	2.80	2.63	2.81	2.93	2.82	9.2
25/04/2025 00:31	50% DVL Start	1218	2.15	1.98	2.15	2.28	2.18	9.2
25/04/2025 00:45	50% DVL End	1218	2.09	1.92	2.09	2.23	2.13	9.1
25/04/2025 00:47	25% DVL Start	614	1.32	1.15	1.31	1.45	1.37	9.1
25/04/2025 01:00	25% DVL End	613	1.25	1.08	1.23	1.37	1.30	8.9
25/04/2025 01:06	0% DVL Start	0	0.45	0.29	0.45	0.52	0.53	8.8

Time	Increment	Load (kN)	Average Disp. (mm)	Disp. 1 (mm)	Disp. 2 (mm)	Disp. 3 (mm)	Disp. 4 (mm)	Temp. (°C)
25/04/2025 02:15	0% DVL End	0	0.27	0.12	0.26	0.33	0.36	8.4
25/04/2025 02:29	100% DVL Start	2421	2.95	2.73	3.03	3.15	2.88	8.3
25/04/2025 03:30	100% DVL End	2419	3.27	3.05	3.35	3.48	3.20	7.7
25/04/2025 03:41	100% DVL + 25% F_{REP} Start	3016	3.99	3.73	4.01	4.20	4.01	7.5
25/04/2025 05:05	100% DVL + 25% F_{REP} End	3025	4.34	4.05	4.37	4.57	4.38	18.6
25/04/2025 05:13	100% DVL + 50% F_{REP} Start	3621	5.27	4.98	5.32	5.52	5.28	19.5
25/04/2025 11:15	100% DVL + 50% F_{REP} End	3628	6.68	6.43	6.67	6.85	6.77	16.8
25/04/2025 11:19	100% DVL + 25% F_{REP} Start	3035	6.27	6.03	6.22	6.42	6.40	16.8
25/04/2025 11:30	100% DVL + 25% F_{REP} End	3034	6.16	5.93	6.11	6.31	6.28	16.5
25/04/2025 11:34	100% DVL Start	2429	5.59	5.32	5.56	5.75	5.71	16.4
25/04/2025 11:45	100% DVL End	2430	5.42	5.18	5.40	5.61	5.51	16.1
25/04/2025 11:46	75% DVL Start	1819	4.78	4.54	4.70	4.95	4.92	16.0
25/04/2025 12:00	75% DVL End	1817	4.64	4.38	4.58	4.84	4.75	15.9
25/04/2025 12:01	50% DVL Start	1215	3.91	3.65	3.83	4.06	4.11	15.9
25/04/2025 12:15	50% DVL End	1214	3.80	3.53	3.78	3.95	3.96	16.3
25/04/2025 12:17	25% DVL Start	610	2.90	2.62	2.88	3.07	3.05	16.4
25/04/2025 12:30	25% DVL End	609	2.75	2.47	2.74	2.90	2.89	16.7
25/04/2025 12:37	0% DVL Start	0	1.74	1.48	1.72	1.91	1.84	16.7
25/04/2025 14:00	0% DVL End	0	1.28	1.02	1.34	1.50	1.27	16.3

Figure 2 – Load and Displacement vs. Time

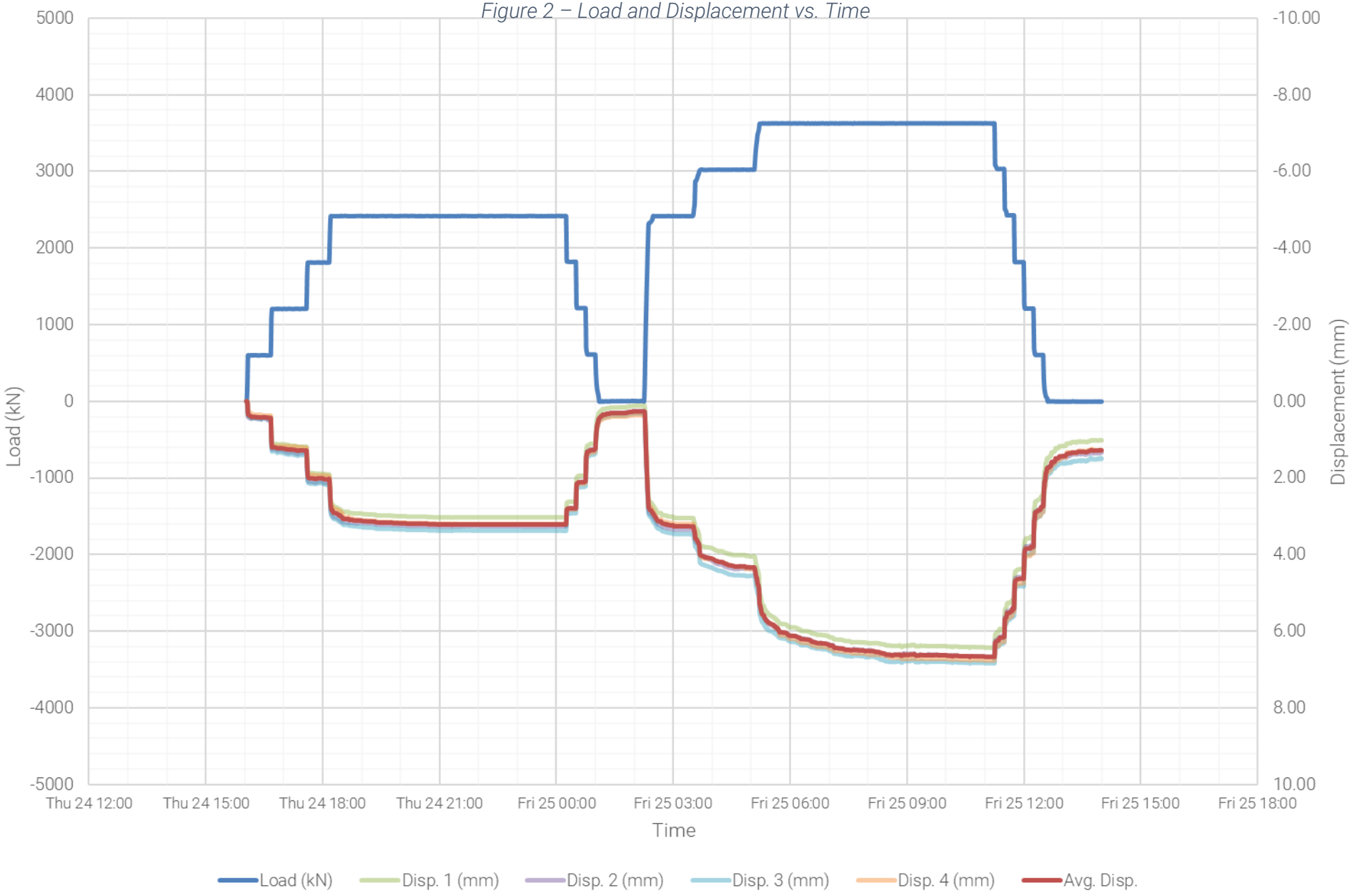
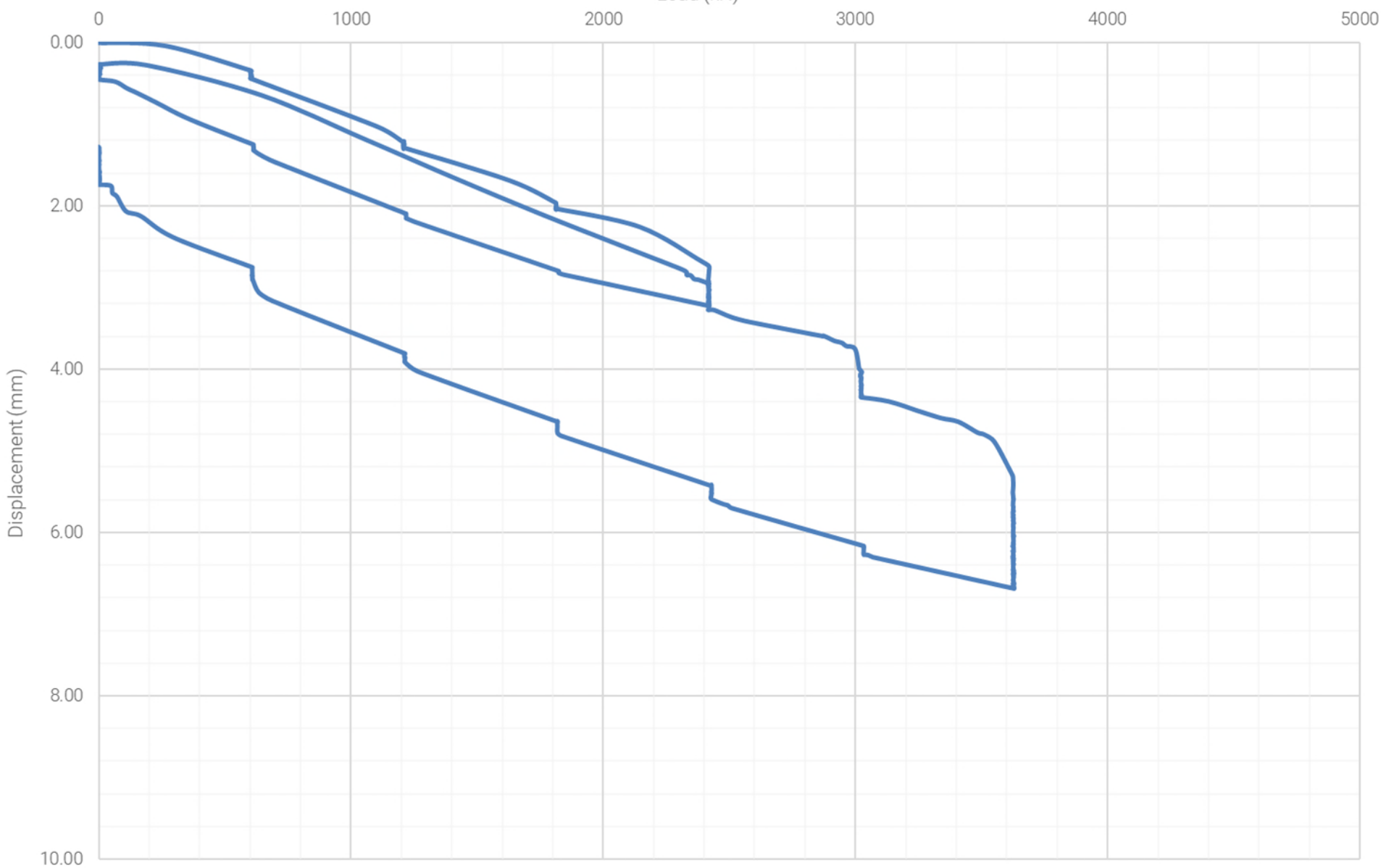


Figure 3 – Load vs. Displacement



Appendix A. - Soil Strata

Material	Depth (m)
Made Ground	3
Alluvium/Peat	4
RTG	5.5
London Clay	6
Harwich Formation	1
Lambeth Sand/Gravel	5.5
Lambeth Clay	4
Thanet Sands	5+

These details are provided by Keltbray.

SOCOTEC UK Limited
Wass Way, Durham Park Industrial Park, Eaglescliffe, TS16 0RG
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CALIBRATION CERTIFICATE

as per Documented In-House Technical Procedure MS90

Certificate Number: LCC-5195

Transducer Serial: PMC502 **Equipment Type:** Load Cell, Spherical Seat Platen

Digital Readout: 20103 **Manufacturer:** Woodland Weighing Systems

Date of Calibration: 27/08/2024 **Date of Issue:** 27/08/2024 **Valid Until:** 27/08/2025

CALIBRATION DATA

Reference Load (kN)	Indicated Load (kN) Run 1	Run 2	Run 3	Average (kN)	Uncertainty %
0	0	0	0	0	0
500	503	503	504	503	1.15
1,000	1,009	1,004	1,008	1,007	1.18
1,500	1,506	1,503	1,509	1,506	1.17
2,000	2,005	2,004	2,006	2,005	1.15
2,500	2,502	2,500	2,503	2,502	1.15
3,000	2,999	2,997	2,999	2,998	1.15
3,500	3,496	3,495	3,498	3,496	1.15
4,000	3,986	3,984	3,987	3,986	1.15
4,500	4,479	4,483	4,484	4,482	1.15
5,000	4,972	4,975	4,974	4,974	1.15
0	0	0	0	0	0

Start Temperature: 19°C End Temperature: 19°C

CALIBRATION EQUIPMENT

Reference	Serial	Description	Calib. Due
Load	PMC 1501	15 MN Master Load Cell	27/03/2025
Temperature	DT-19	Digital Thermometer	31/08/2025

FACTOR: 2355

OFFSET: 70.00449

Calibrated by: Ross Lazenby

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

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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

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