

32-33 TORRINGTON SQUARE  
MONITORING

Monitoring Report  
SES-10215-MR02

Date of survey completion: 4<sup>th</sup> June 2018

## Executive Summary

### Instrumentation Installed

Targets, precise Level points have been installed at key locations on site.

#### Instrumentation:

<b>Total Station:</b>	Leica TS30 Motorised Total Station Angular Standard Deviation $\pm 0.5''$ arc Distance Standard Deviation $\pm 0.5\text{mm}+1\text{ppm}$ Absolute accuracy of horizontal readings: $\pm 2\text{mm}$
<b>Level:</b>	Leica DNA03 Precision Digital Level Leica GPCL2 Invar Bar Coded Staff Standard Deviation 0.4mm for a 1km double-run

### Summary of Results

#### ***Targets on Front Elevation of The Warburg Institute***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on Side Elevation of The Warburg Institute***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on Rear Elevation of The Warburg Institute***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on Staircase***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on back garden of No. 31 Torrington Square***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on back garden of No. 32 Torrington Square***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on Rear Elevation of No. 32 Torrington Square***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

#### ***Targets on Side Elevation of No. 32 Torrington Square***

Targets are showing negligible horizontal movement.  
Targets are showing negligible vertical movement.

## Executive Summary

### ***Targets on Front Elevation of No. 32 Torrington Square***

Targets are showing negligible horizontal movement.

Targets are showing negligible vertical movement.

### ***Targets on Front Elevation of No. 31 Torrington Square***

Targets are showing negligible horizontal movement.

Targets are showing negligible vertical movement.

### ***Targets on Heating Tunnel***

Targets are showing negligible horizontal movement.

Targets are showing negligible vertical movement.

### ***Precise Level Points along courtyard***

Precise level points are showing negligible movement.

Precise level 111 point was found disturbed by digger.

### ***Precise Level Points on Front Elevation of The Warburg Institute***

Precise level points are showing negligible movement.

### ***Precise Level Points on Side Elevation of The Warburg Institute***

Precise level points are showing negligible movement.

### ***Precise Level Points on Rear Elevation of The Warburg Institute***

Precise level points are showing negligible movement.

### ***Precise Level Points on Side Elevation of No. 32 Torrington Square***

Precise level points are showing negligible movement.

### ***Precise Level Points on Front Elevation of No. 32 Torrington Square***

Precise level points are showing negligible movement.

### ***Precise Level Points on Front Elevation of No. 31 Torrington Square***

Precise level points are showing negligible movement.

### ***Precise Level Points on Staircase***

Precise level points are showing negligible movement.

## Survey Schedule and Notes

Report No.	Quote / PCP Number	Quote Item Number	Date(s)	Type of Survey	Survey Description	Weather	Surveyor(s)
MIR	2222-SMrevA	1.2.1	02-04/05/18	Installation	Installation of Monitoring 3D Reflective Targets	Showers, 12°C	P. Le
	2222-SMrevA	1.2.2	08, 09, 11/05/18	Installation	Installation of Precise Level Points	Sunny, 25°C	
	2222-SMrevA	1.2.3	10, 11, 15, 17/05/18	Base Readings	Control establishment. Base readings of 3D Reflective Targets and Precise Level Points	Partly Sunny, 17°C	
1	2222-SMrevA	1.3.1	21/05/18	Targ+Lev	Monitoring Survey of 3D Reflective Targets and Precise Level Points	Partly Sunny, 20°C	P. Le
2	2222-SMrevA	1.3.1	04/06/18	Targ+Lev	Monitoring Survey of 3D Reflective Targets and Precise Level Points	Mostly Cloudy, 17°C	C. Ciuca

Absolute accuracy of readings: ±2mm

A positive value in the dE column, denotes positive movement in the Eastings coordinate plane and vice versa.

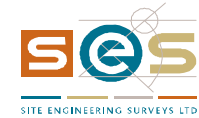
A positive value in the dN column, denotes positive movement in the Northings coordinate plane and vice versa.

A positive value in the dElev column, denotes heave and vice versa

Site Engineering Surveys Ltd.

32-33 Torrington Square

Job no. 10215



### 3D Position Monitoring

Point	Date of base readings	Average Base readings			Diff to base (mm)			Diff to base (mm)		
					21/05/18			04/06/18		
		Easting	Northing	Level	dE	dN	dElev	dE	dN	dElev

#### Targets on Front Elevation of The Warburg Institute

201	04/05/18	515.460	312.267	19.458	1	0	0	1	-1	0
202	04/05/18	515.434	312.323	15.535	1	0	0	0	-1	0
203	04/05/18	515.411	312.224	11.556	0	0	0	0	0	0
204	04/05/18	515.121	304.761	18.913	0	0	0	1	-1	0
205	04/05/18	515.126	304.854	15.647	0	0	0	0	-1	0
206	04/05/18	515.132	304.796	11.944	1	0	0	1	-1	0

#### Targets on Side Elevation of The Warburg Institute

207	04/05/18	520.607	304.266	17.161	0	0	0	-1	0	0
208	04/05/18	520.408	304.269	14.146	0	0	0	-1	1	1
209	04/05/18	520.369	304.274	11.015	0	0	0	-1	0	0
210	04/05/18	525.513	304.152	18.053	0	0	0	0	0	0
211	04/05/18	525.512	304.154	15.024	0	0	0	0	0	0
212	04/05/18	525.501	304.157	10.712	0	0	0	-1	0	0

#### Targets on Rear Elevation of The Warburg Institute

213	04/05/18	525.600	309.001	19.410	0	0	0	0	0	0
214	04/05/18	525.602	309.021	16.662	0	0	0	0	0	0
215	04/05/18	525.611	309.370	10.468	-2	1	0	-1	1	0

Absolute accuracy of readings: ±2mm

A positive value in the dE column, denotes positive movement in the Eastings coordinate plane and vice versa.

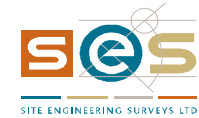
A positive value in the dN column, denotes positive movement in the Northings coordinate plane and vice versa.

A positive value in the dElev column, denotes heave and vice versa

Site Engineering Surveys Ltd.

32-33 Torrington Square

Job no. 10215



### 3D Position Monitoring

Point	Date of base readings	Average Base readings			Diff to base (mm)			Diff to base (mm)		
					21/05/18			04/06/18		
		Easting	Northing	Level	dE	dN	dElev	dE	dN	dElev

#### Targets on Staircase

216	04/05/18	526.630	304.479	18.167	0	0	0	0	0	0
217	04/05/18	526.637	304.511	15.301	0	0	0	0	1	0
218	04/05/18	526.642	304.490	10.893	0	0	0	0	1	0
219	04/05/18	529.668	304.440	17.914	0	0	0	0	0	-1
220	04/05/18	530.462	304.445	14.594	0	0	0	-1	0	-1
221	04/05/18	530.464	304.424	10.483	-1	0	0	-1	0	0
222	04/05/18	526.678	306.912	18.349	0	0	0	0	0	-1
223	04/05/18	526.679	306.960	15.330	0	0	0	0	0	0
224	04/05/18	526.692	306.951	10.921	-1	0	0	0	0	0
225	04/05/18	529.716	306.897	17.946	0	0	0	-1	0	-1
226	04/05/18	530.509	306.878	14.573	0	0	0	-1	0	0
227	04/05/18	530.518	306.877	10.398	0	0	0	-1	0	-1

#### Targets on back garden of No. 31 Torrington Square

228	04/05/18	535.556	284.820	11.483	0	0	0	2	-1	0
-----	----------	---------	---------	--------	---	---	---	---	----	---

#### Targets on back garden of No. 32 Torrington Square

229	04/05/18	535.369	290.927	11.473	0	0	0	-1	0	0
230	04/05/18	535.383	290.797	9.635	0	0	0	-1	0	0
231	04/05/18	535.457	296.376	11.474	0	0	0	1	1	0
232	04/05/18	535.455	296.367	9.482	0	0	0	-1	0	0

Absolute accuracy of readings: ±2mm

A positive value in the dE column, denotes positive movement in the Eastings coordinate plane and vice versa.

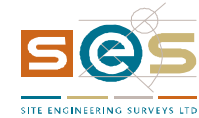
A positive value in the dN column, denotes positive movement in the Northings coordinate plane and vice versa.

A positive value in the dElev column, denotes heave and vice versa

Site Engineering Surveys Ltd.

32-33 Torrington Square

Job no. 10215



### 3D Position Monitoring

Point	Date of base readings	Average Base readings			Diff to base (mm)			Diff to base (mm)		
					21/05/18			04/06/18		
		Easting	Northing	Level	dE	dN	dElev	dE	dN	dElev

#### Targets on Rear Elevation of No. 32 Torrington Square

233	04/05/18	529.166	290.701	16.136	0	0	0	0	1	0
234	04/05/18	529.161	290.700	13.973	0	0	0	0	2	0
235	04/05/18	529.205	293.076	16.097	-1	-1	0	-1	0	0
236	04/05/18	529.206	293.089	13.722	-2	-1	0	-1	0	0
237	04/05/18	524.917	293.273	21.612	-1	0	0	-1	1	0
238	04/05/18	524.908	293.307	18.566	0	0	0	-1	1	0
239	04/05/18	524.942	294.721	21.677	-1	0	0	-1	0	0
240	04/05/18	524.940	294.743	18.579	-1	0	0	-1	0	0
241	04/05/18	524.932	294.161	14.392	0	0	0	-1	1	0
242	04/05/18	524.965	296.822	21.627	0	0	0	-1	0	0
243	04/05/18	524.965	296.801	18.565	-1	0	0	-1	0	0

#### Targets on Side Elevation of No. 32 Torrington Square

244	04/05/18	521.462	297.063	18.957	0	0	0	-1	0	0
245	04/05/18	521.566	297.043	15.945	-1	0	0	-1	0	0
246	04/05/18	521.591	297.024	12.581	0	0	0	-1	1	0
247	04/05/18	515.809	297.213	19.556	0	0	0	0	0	0
248	04/05/18	515.740	297.198	15.776	0	0	0	0	0	0
249	04/05/18	515.692	297.181	12.685	0	0	0	0	0	0

Absolute accuracy of readings: ±2mm

A positive value in the dE column, denotes positive movement in the Eastings coordinate plane and vice versa.

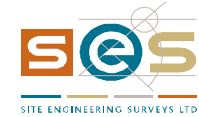
A positive value in the dN column, denotes positive movement in the Northings coordinate plane and vice versa.

A positive value in the dElev column, denotes heave and vice versa

Site Engineering Surveys Ltd.

32-33 Torrington Square

Job no. 10215



### 3D Position Monitoring

Point	Date of base readings	Average Base readings			Diff to base (mm)			Diff to base (mm)		
					21/05/18			04/06/18		
		Easting	Northing	Level	dE	dN	dElev	dE	dN	dElev

#### Targets on Front Elevation of No. 32 Torrington Square

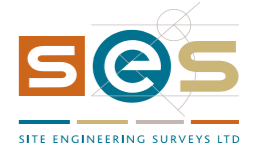
265	04/05/18	513.955	296.690	22.500	0	0	0	0	0	0
250	15/05/18	513.981	296.649	18.591	1	-1	0	0	0	0
251	15/05/18	513.986	296.694	16.542	0	0	0	0	0	0
252	15/05/18	513.970	296.684	14.150	1	0	0	0	0	0
266	04/05/18	513.818	293.332	22.522	0	0	0	1	-1	1
253	15/05/18	513.912	293.142	18.604	0	0	0	0	0	0
254	15/05/18	513.897	293.252	16.485	1	-1	0	0	0	0
255	15/05/18	513.902	293.001	14.257	0	0	0	0	0	0

#### Targets on Front Elevation of No. 31 Torrington Square

256	04/05/18	513.839	290.257	20.774	1	0	0	0	1	-1
257	04/05/18	513.833	290.239	17.719	0	0	0	-1	1	0
258	04/05/18	513.811	290.209	14.841	1	0	0	0	2	0
259	04/05/18	513.785	287.788	20.598	1	0	0	0	1	0
260	04/05/18	513.761	287.756	17.761	1	0	0	0	2	0
261	04/05/18	513.745	287.788	14.813	1	0	0	0	2	0
262	04/05/18	513.696	284.941	20.730	0	0	0	0	1	0
263	04/05/18	513.700	285.000	17.724	1	1	0	0	2	0
264	04/05/18	513.745	284.748	14.678	1	1	0	0	2	0

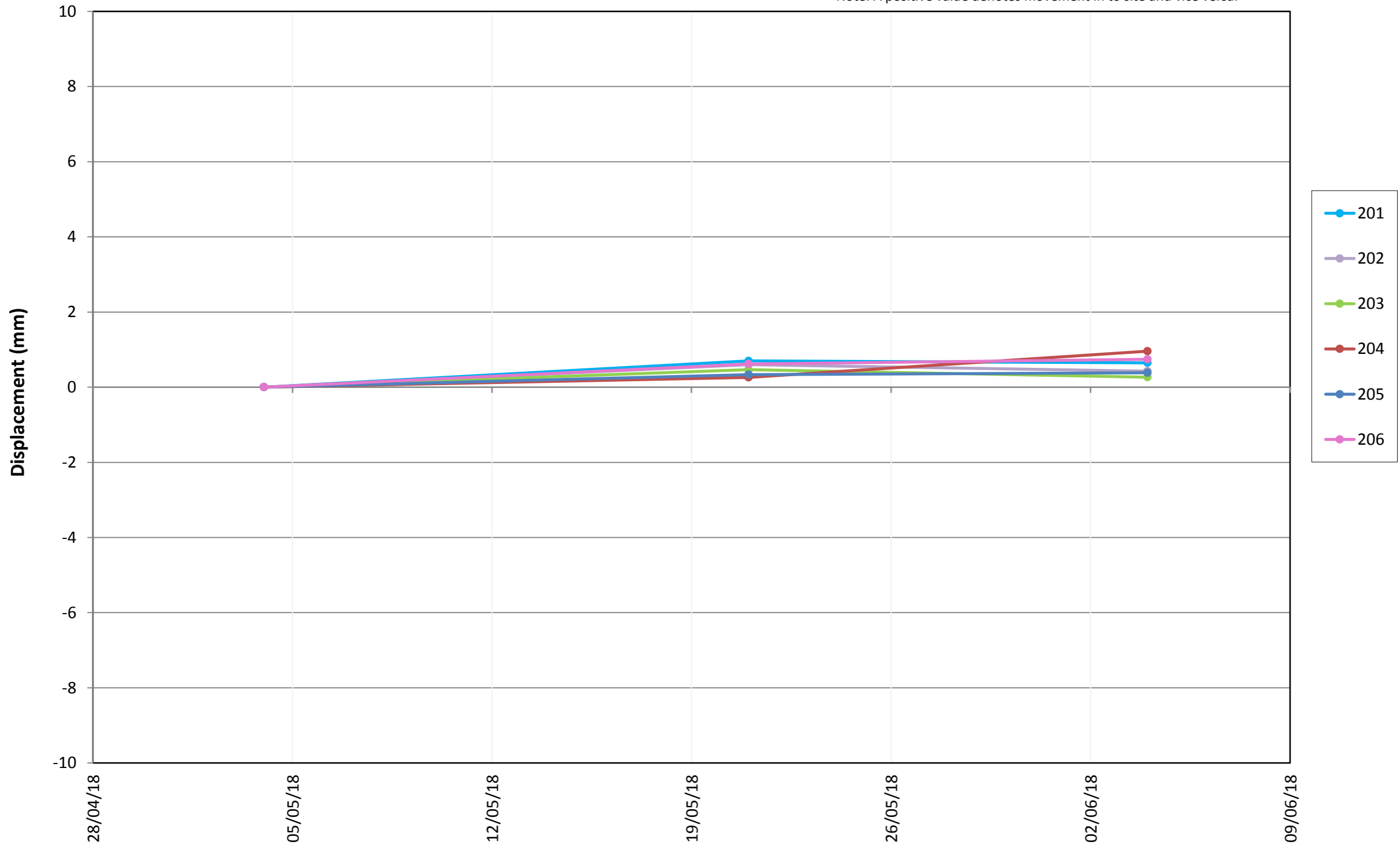


# Transverse Displacement Graph

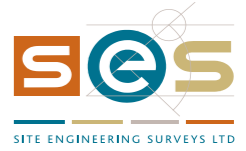


Graph 01T - Targets on Front Elevation of The Warburg Institute

Note: A positive value denotes movement in to site and vice versa.

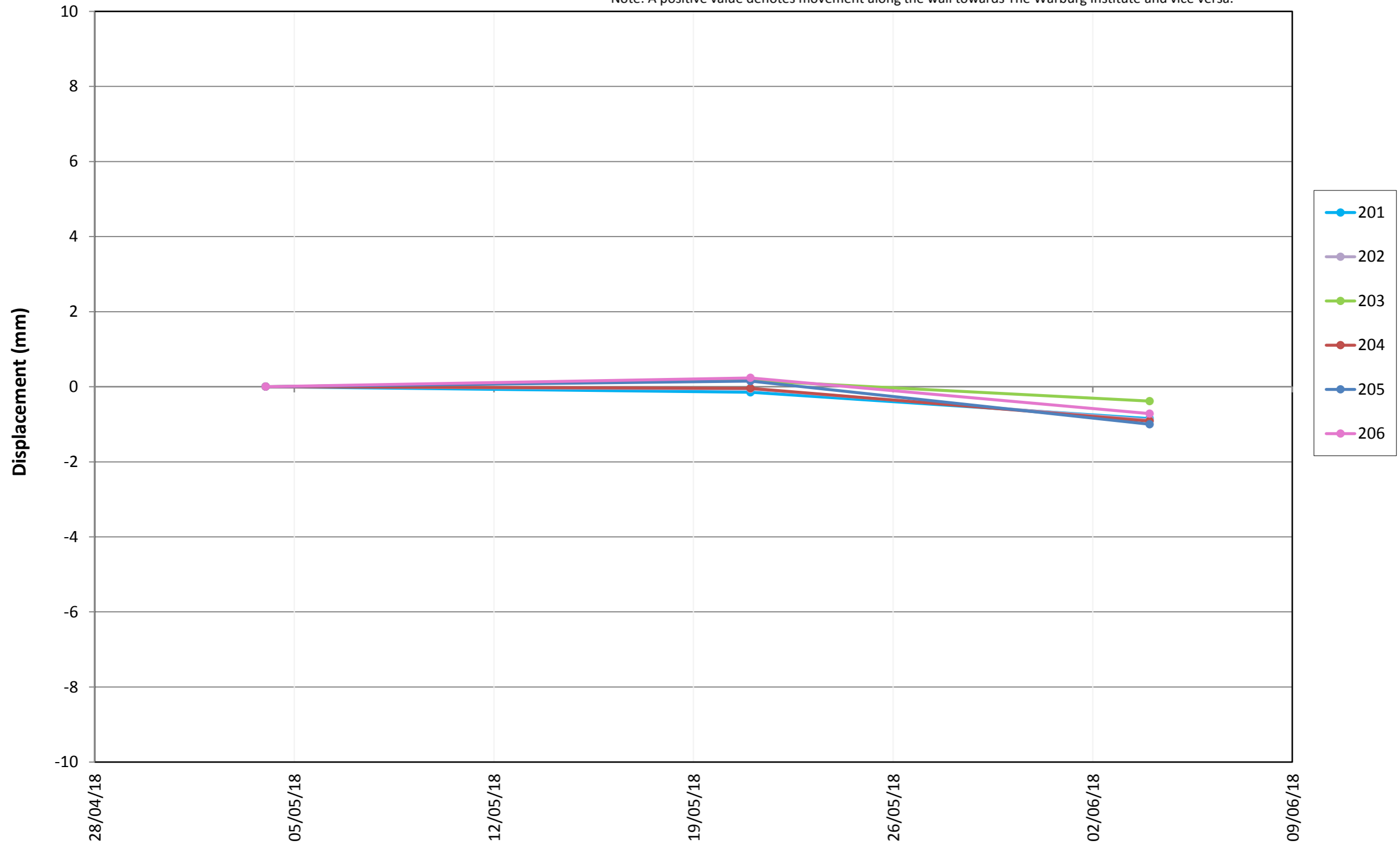


# Longitudinal Displacement Graph

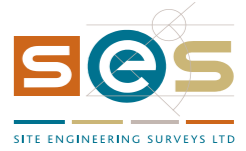


Graph 01L - Targets on Front Elevation of The Warburg Institute

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.

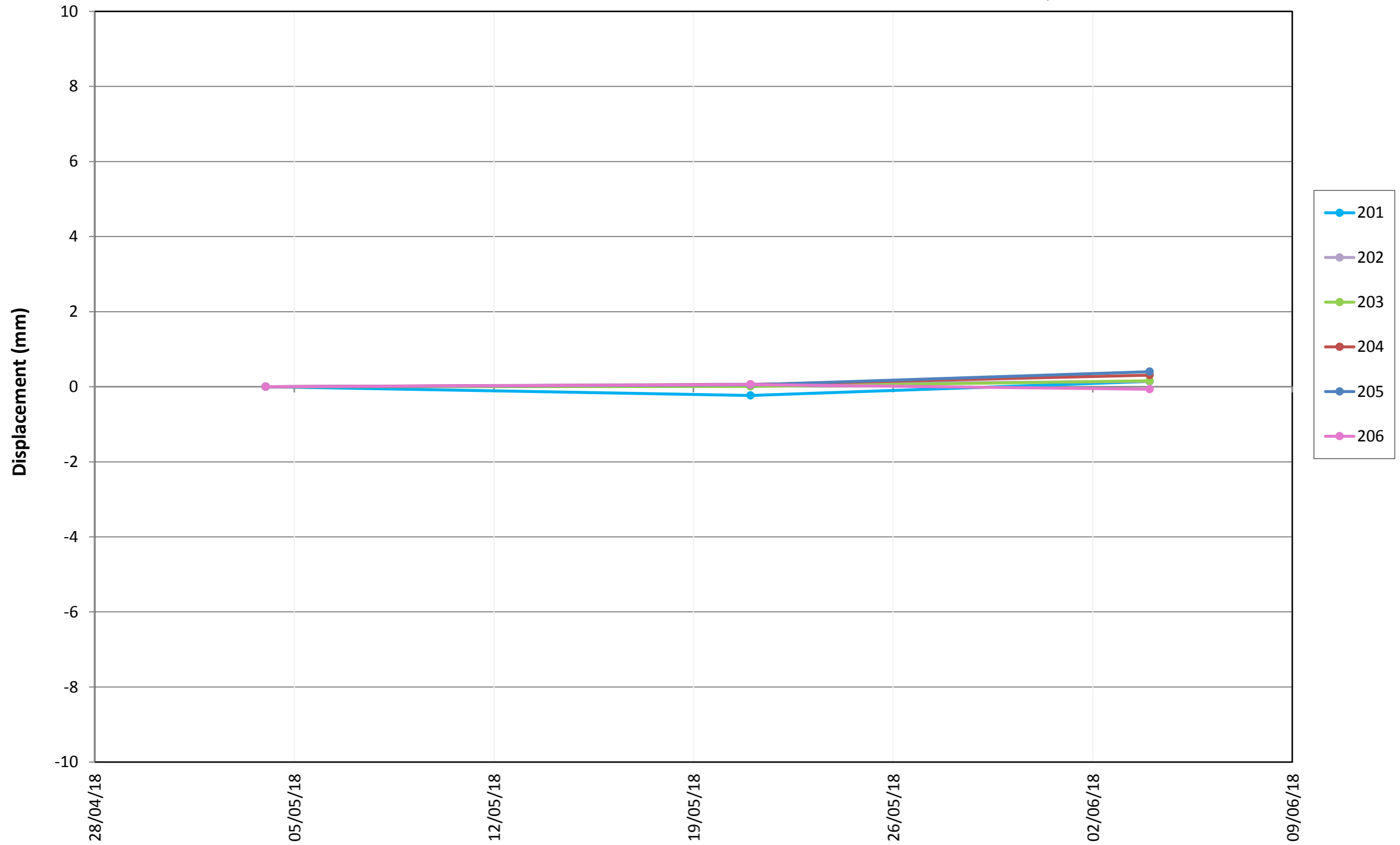


# Vertical Displacement Graph

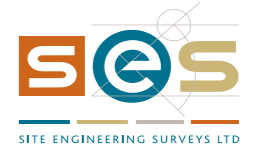


Graph 01V - Targets on Front Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.

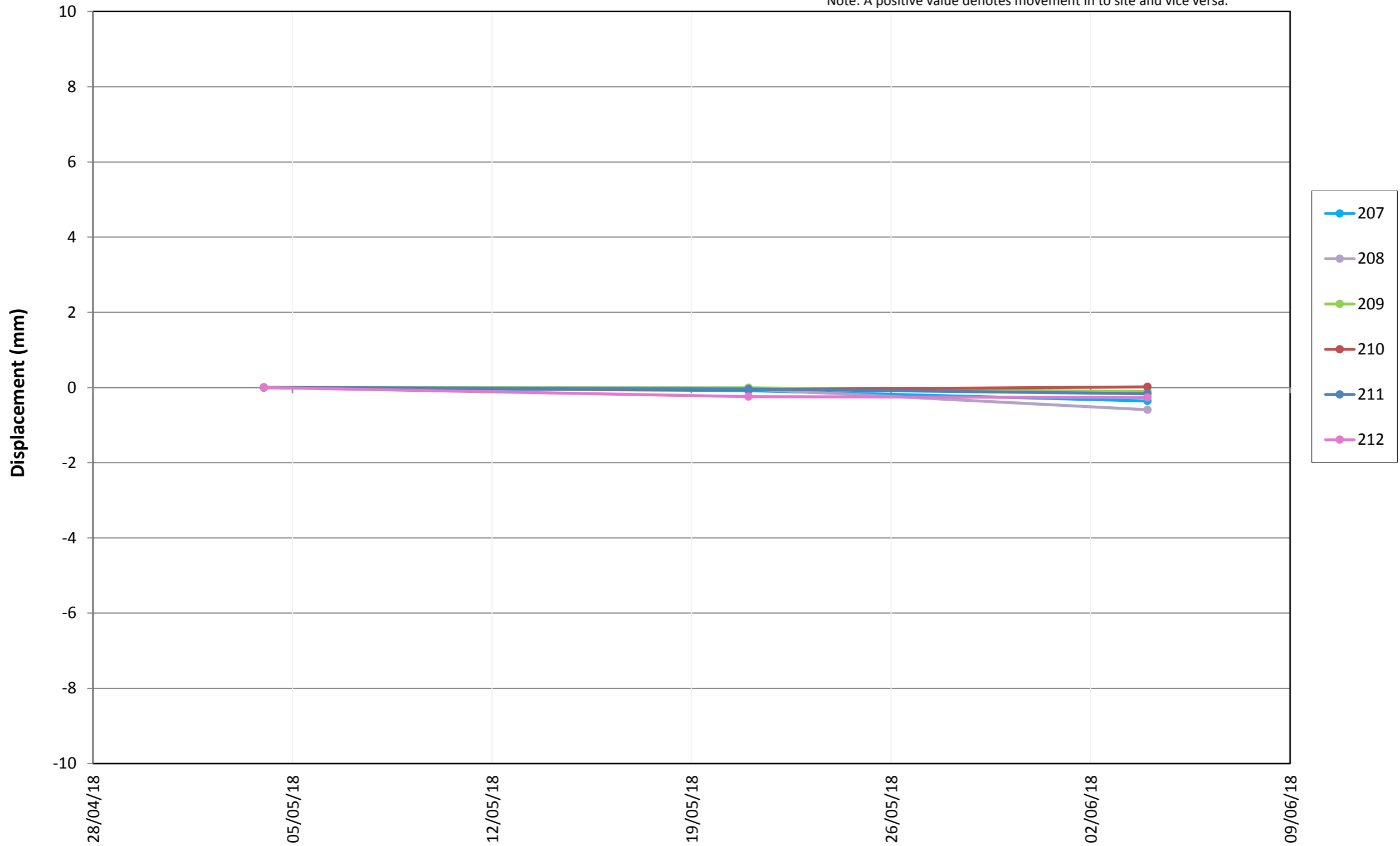


# Transverse Displacement Graph

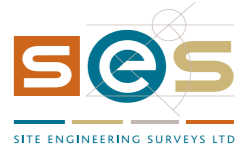


Graph 02T - Targets on Side Elevation of The Warburg Institute

Note: A positive value denotes movement in to site and vice versa.

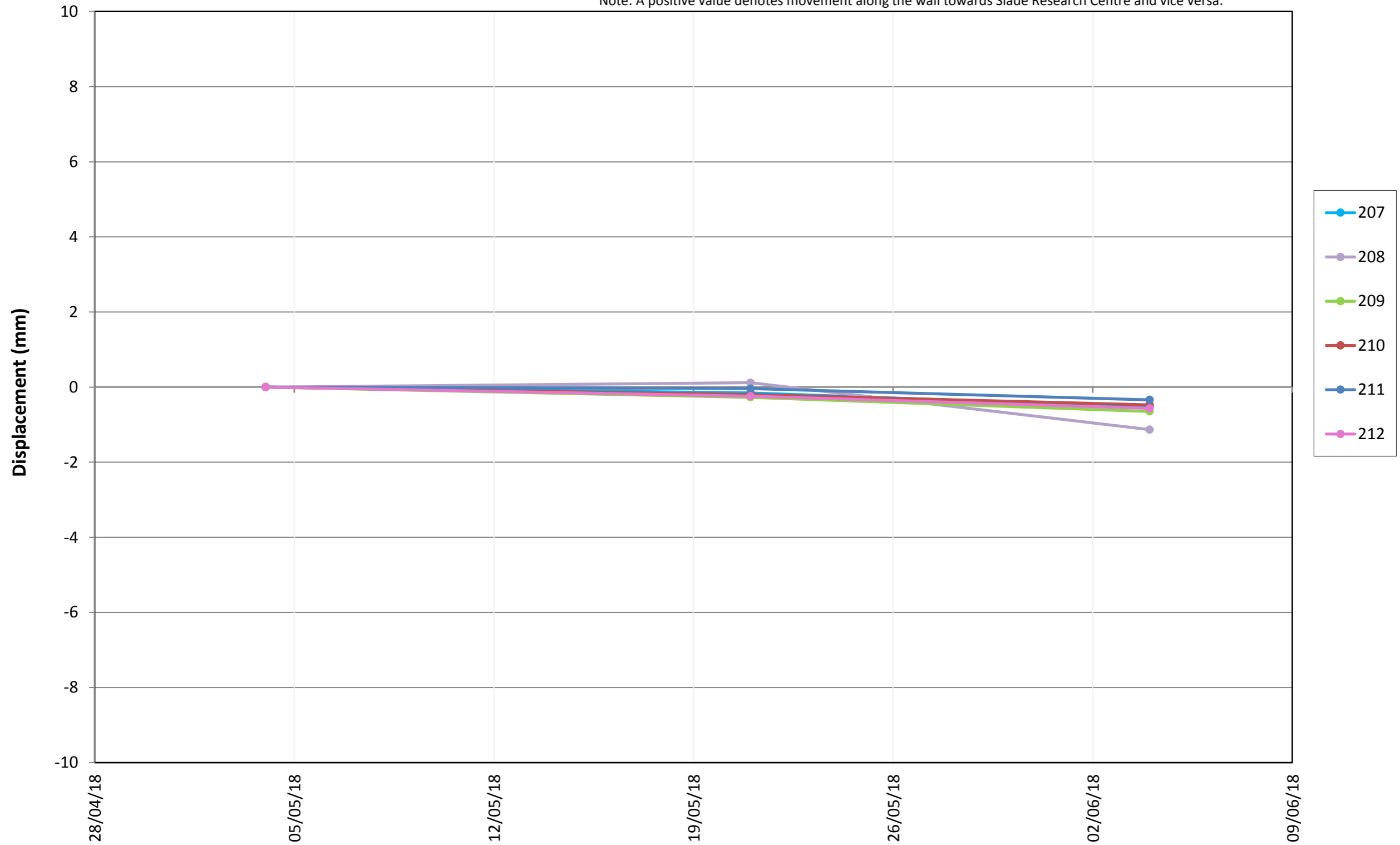


# Longitudinal Displacement Graph

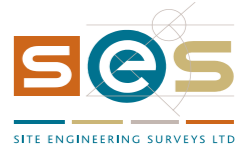


Graph 02L - Targets on Side Elevation of The Warburg Institute

Note: A positive value denotes movement along the wall towards Slade Research Centre and vice versa.

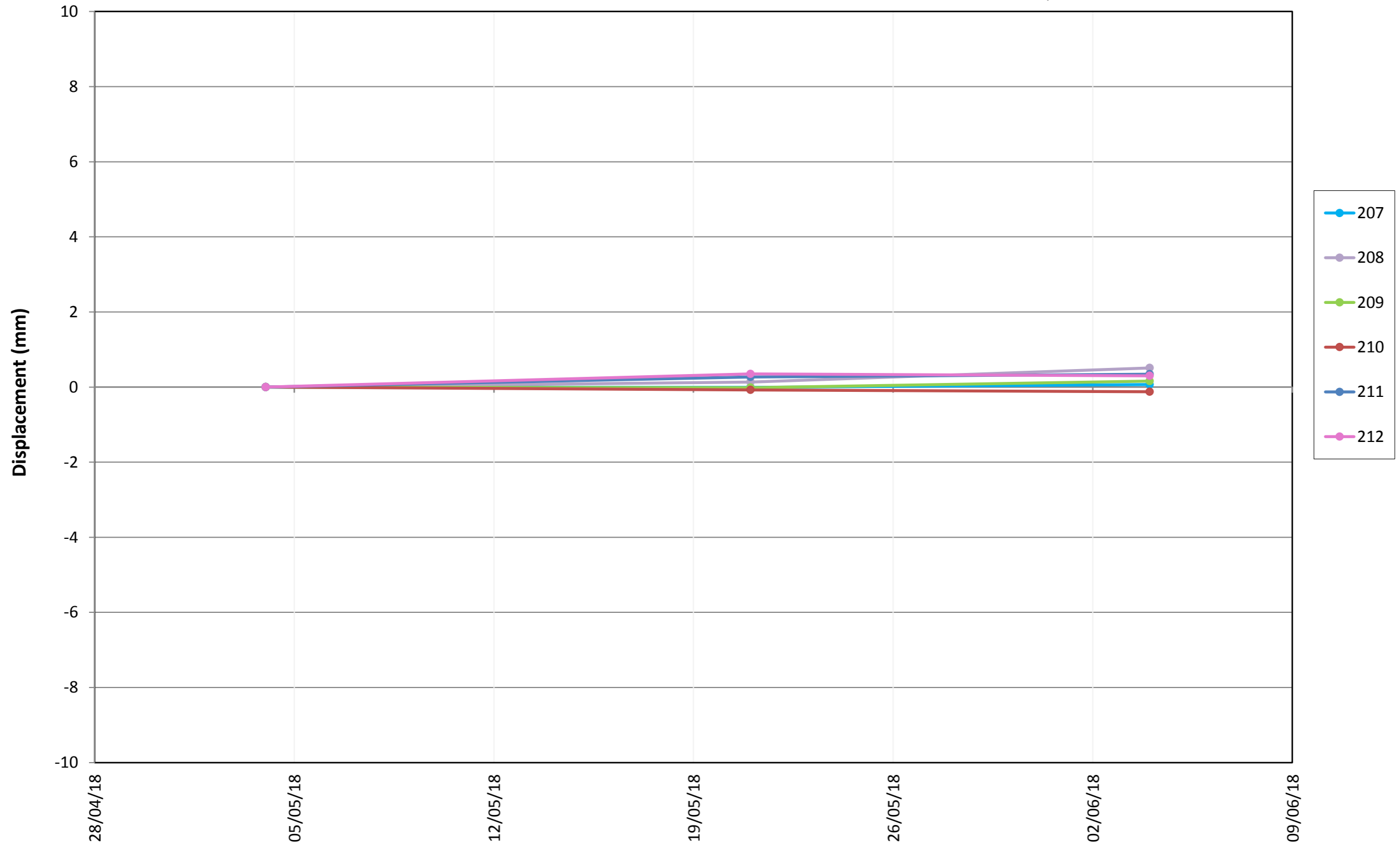


# Vertical Displacement Graph

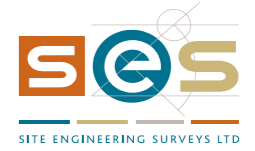


Graph 02V - Targets on Side Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.

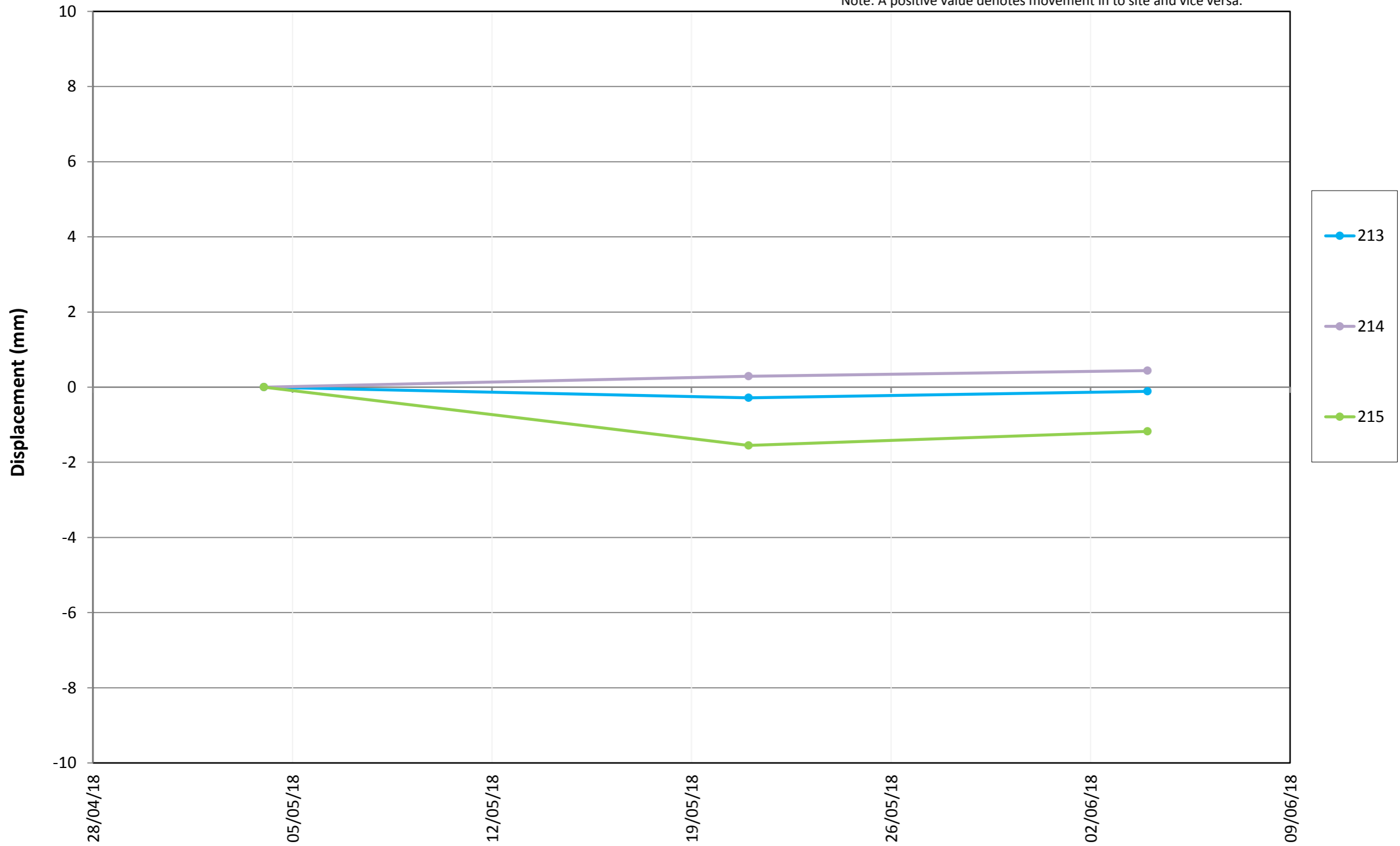


# Transverse Displacement Graph

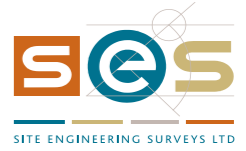


Graph 03T - Targets on Rear Elevation of The Warburg Institute

Note: A positive value denotes movement in to site and vice versa.

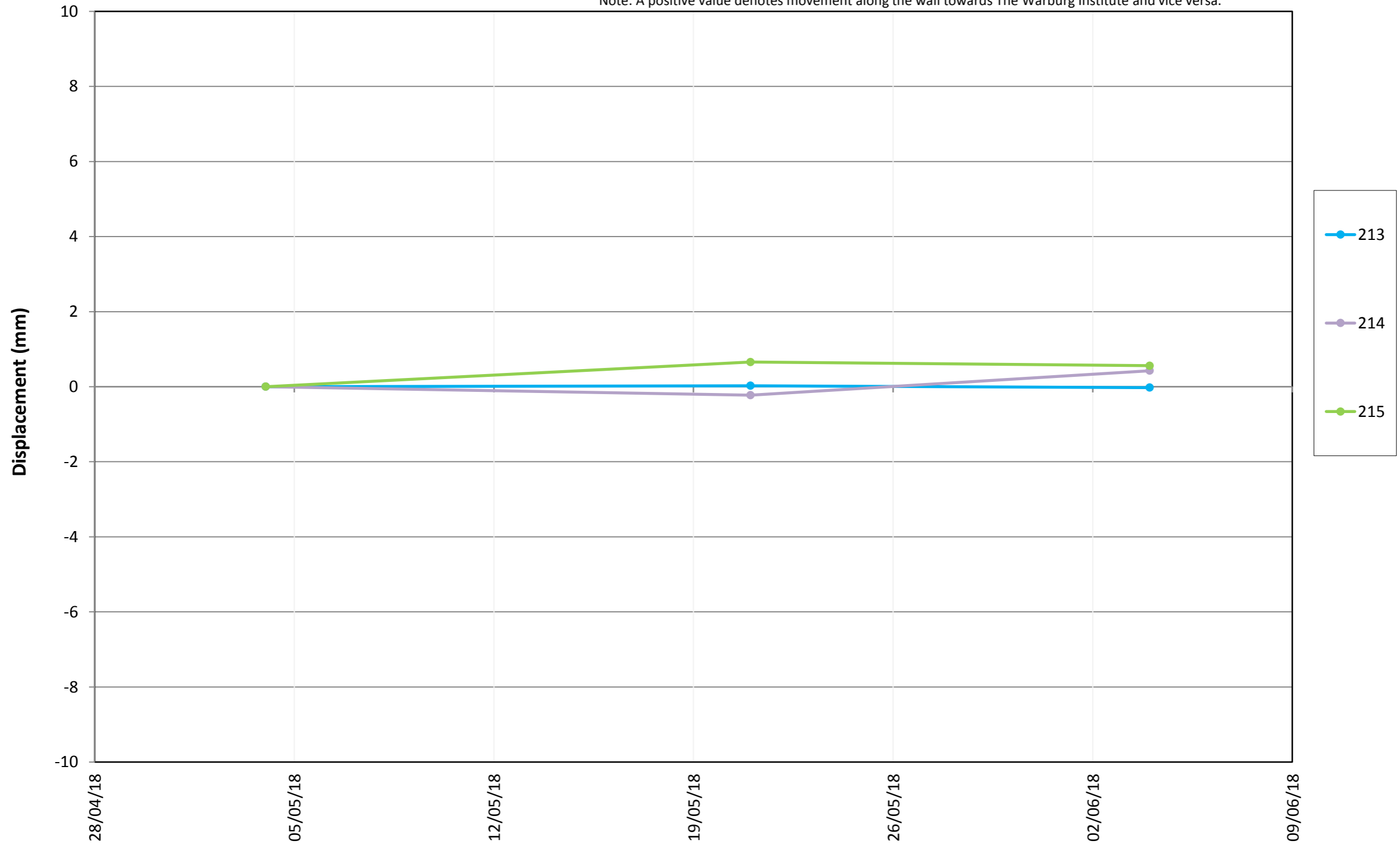


# Longitudinal Displacement Graph



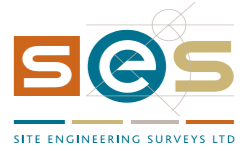
Graph 03L - Targets on Rear Elevation of The Warburg Institute

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.



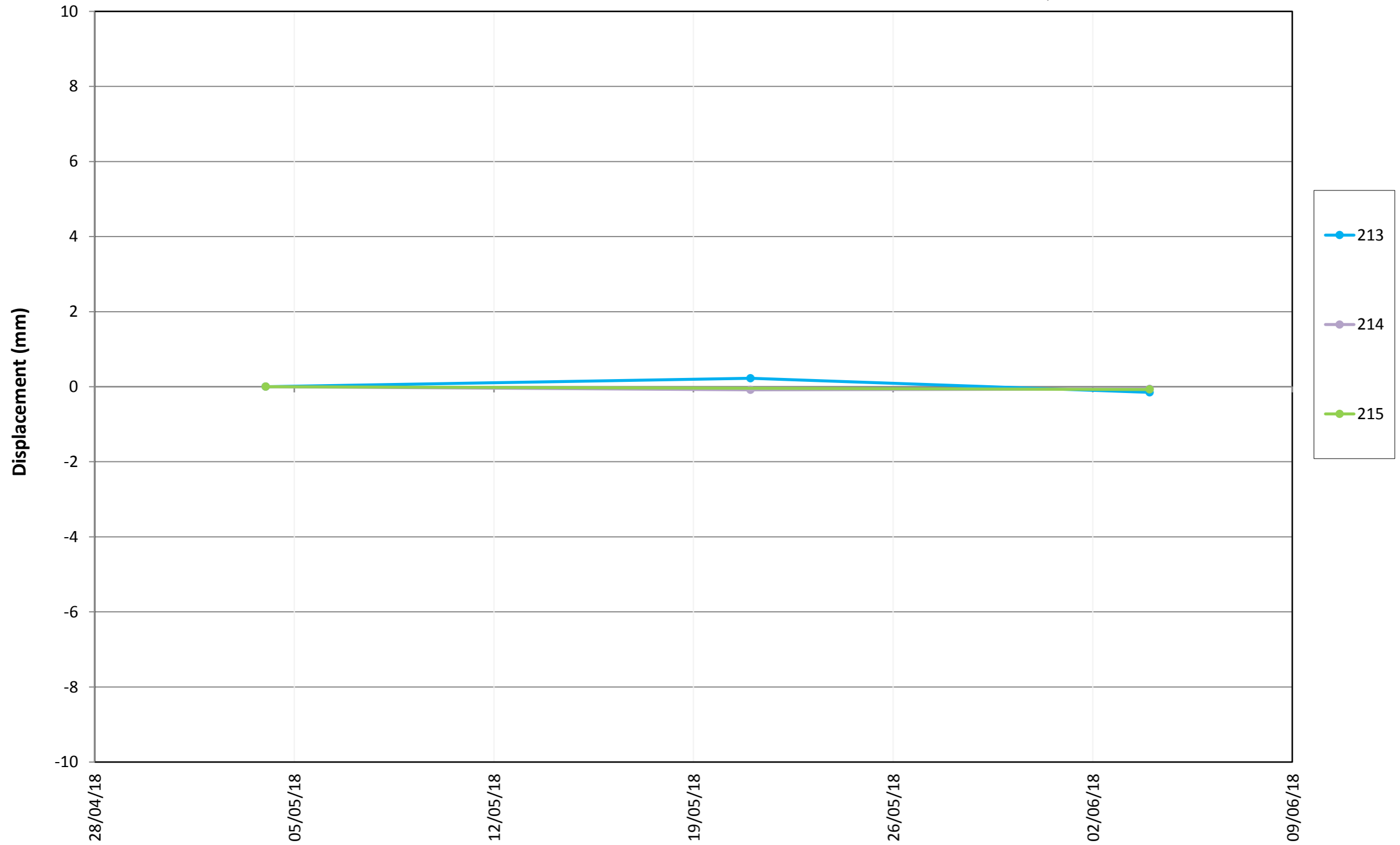


# Vertical Displacement Graph

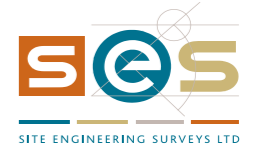


Graph 03V - Targets on Rear Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.

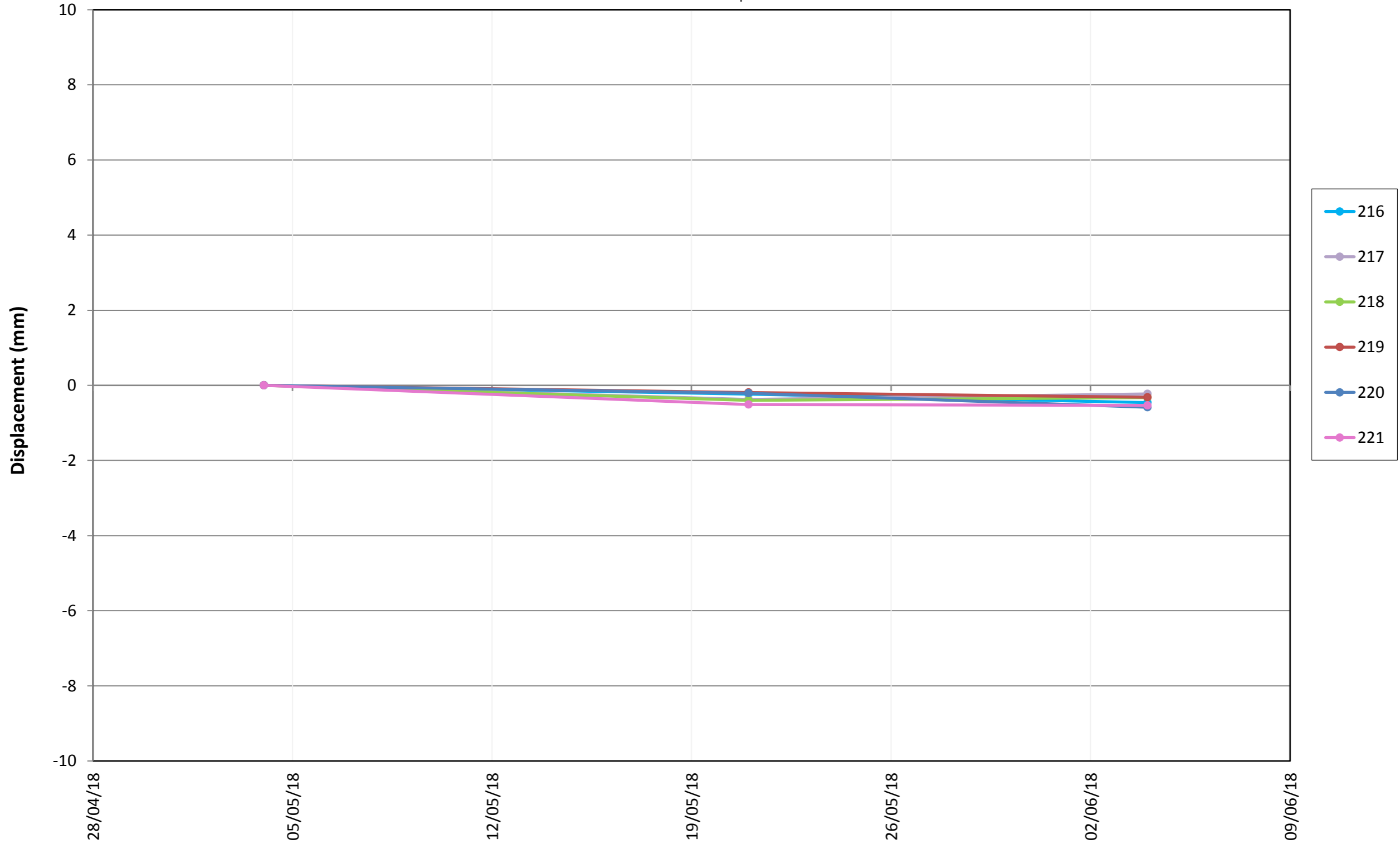


# Transverse Displacement Graph

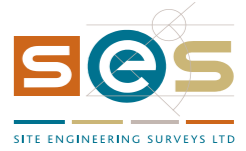


Graph 04T - Targets on Staircase

Note: A positive value denotes movement towards Slade Research Centre and vice versa.

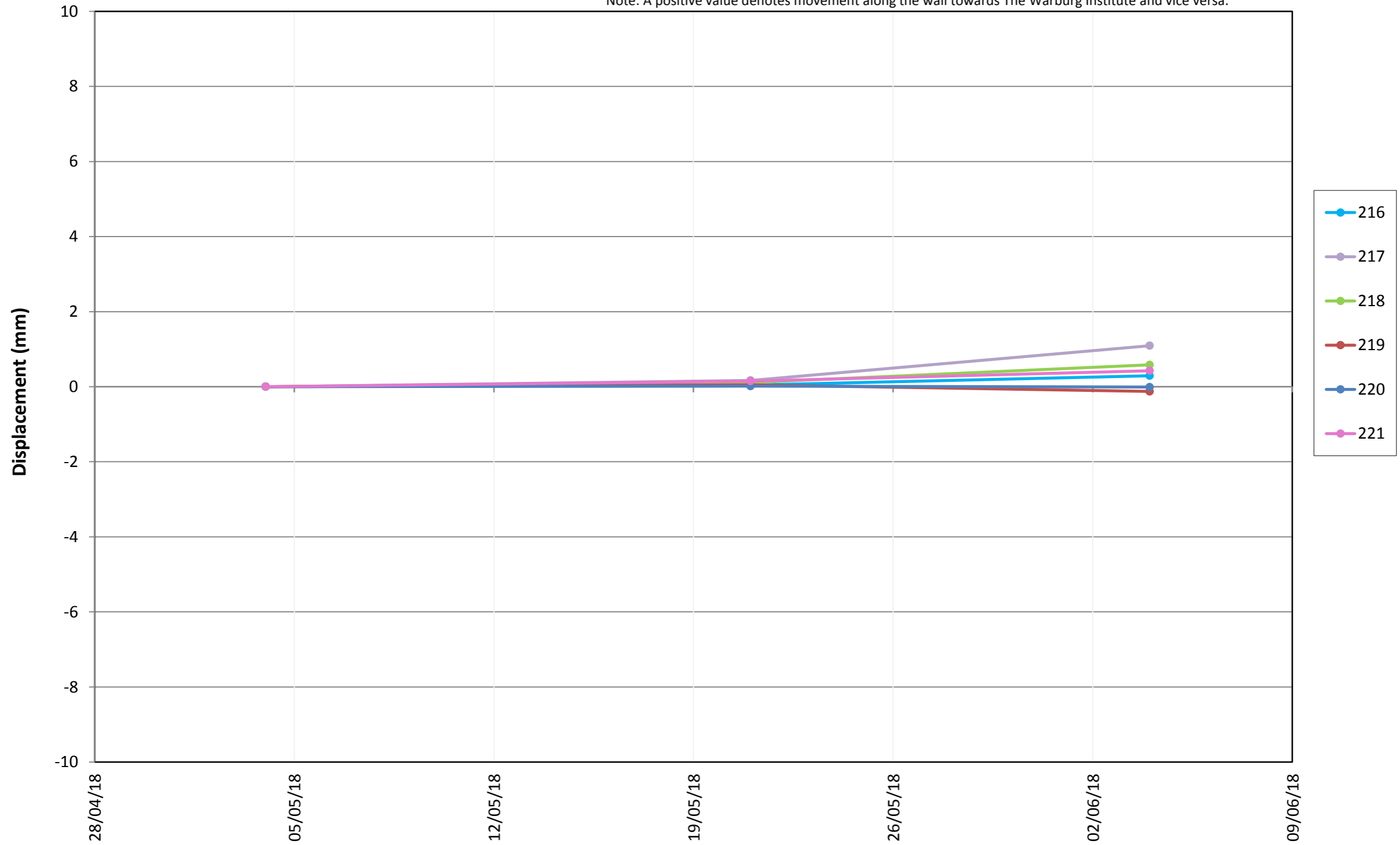


# Longitudinal Displacement Graph

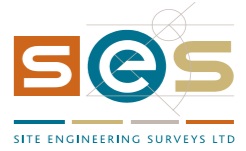


Graph 04L - Targets on Staircase

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.

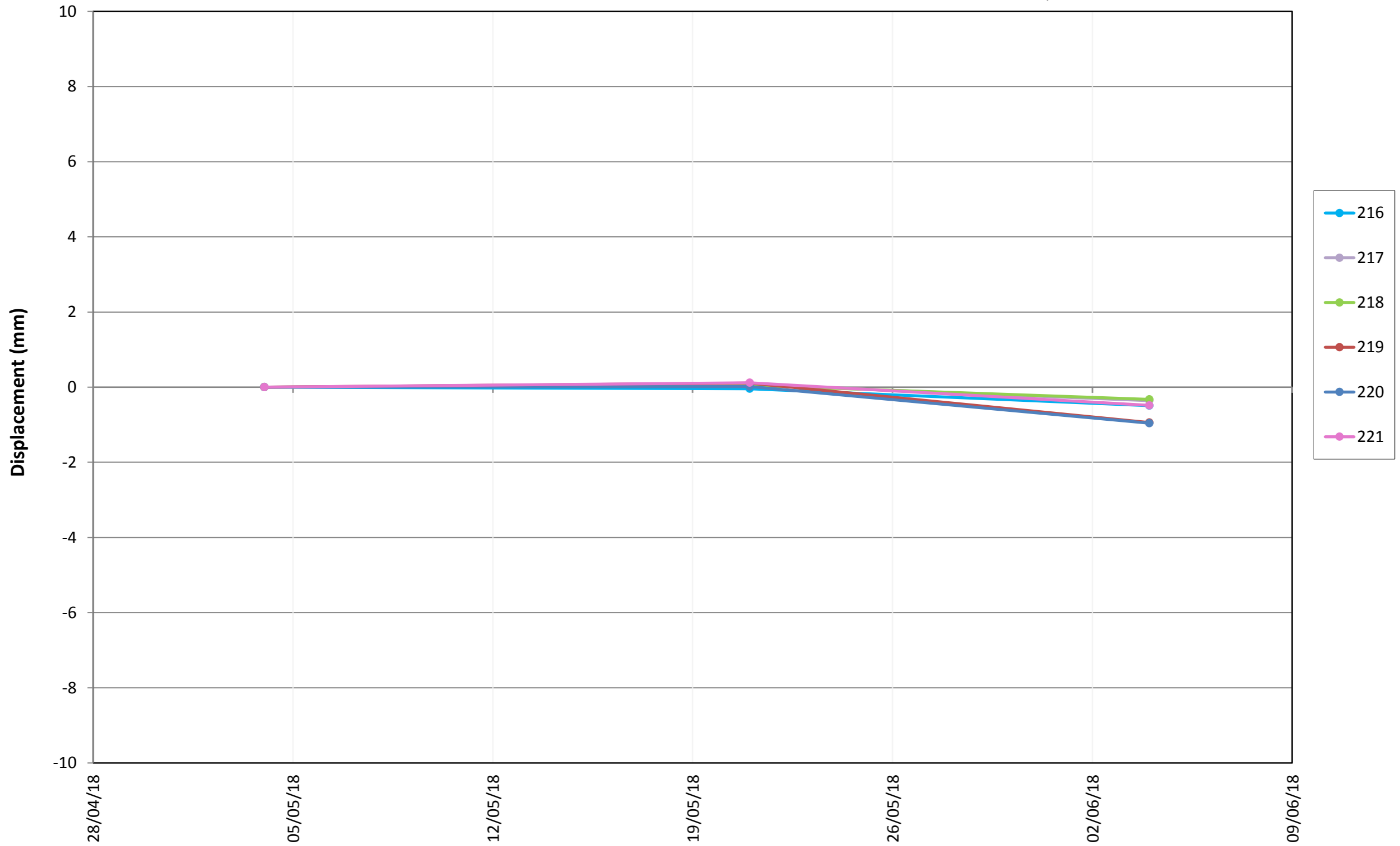


# Vertical Displacement Graph

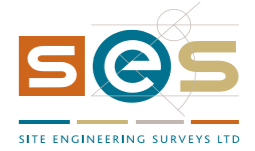


Graph 04V - Targets on Staircase

Note: +ve value denotes heave, -ve value denotes settlement.

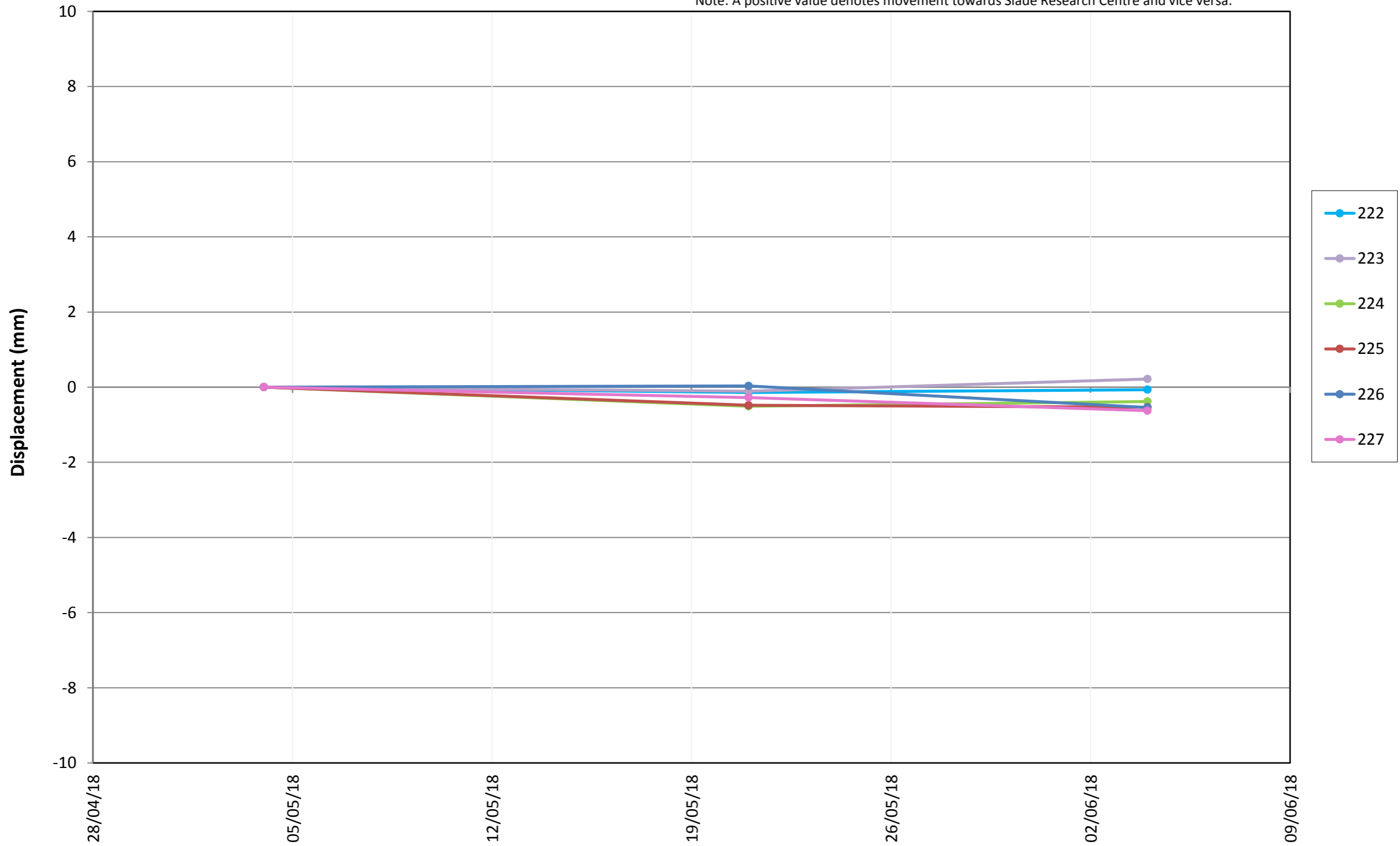


# Transverse Displacement Graph

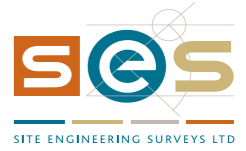


Graph 05T - Targets on Staircase

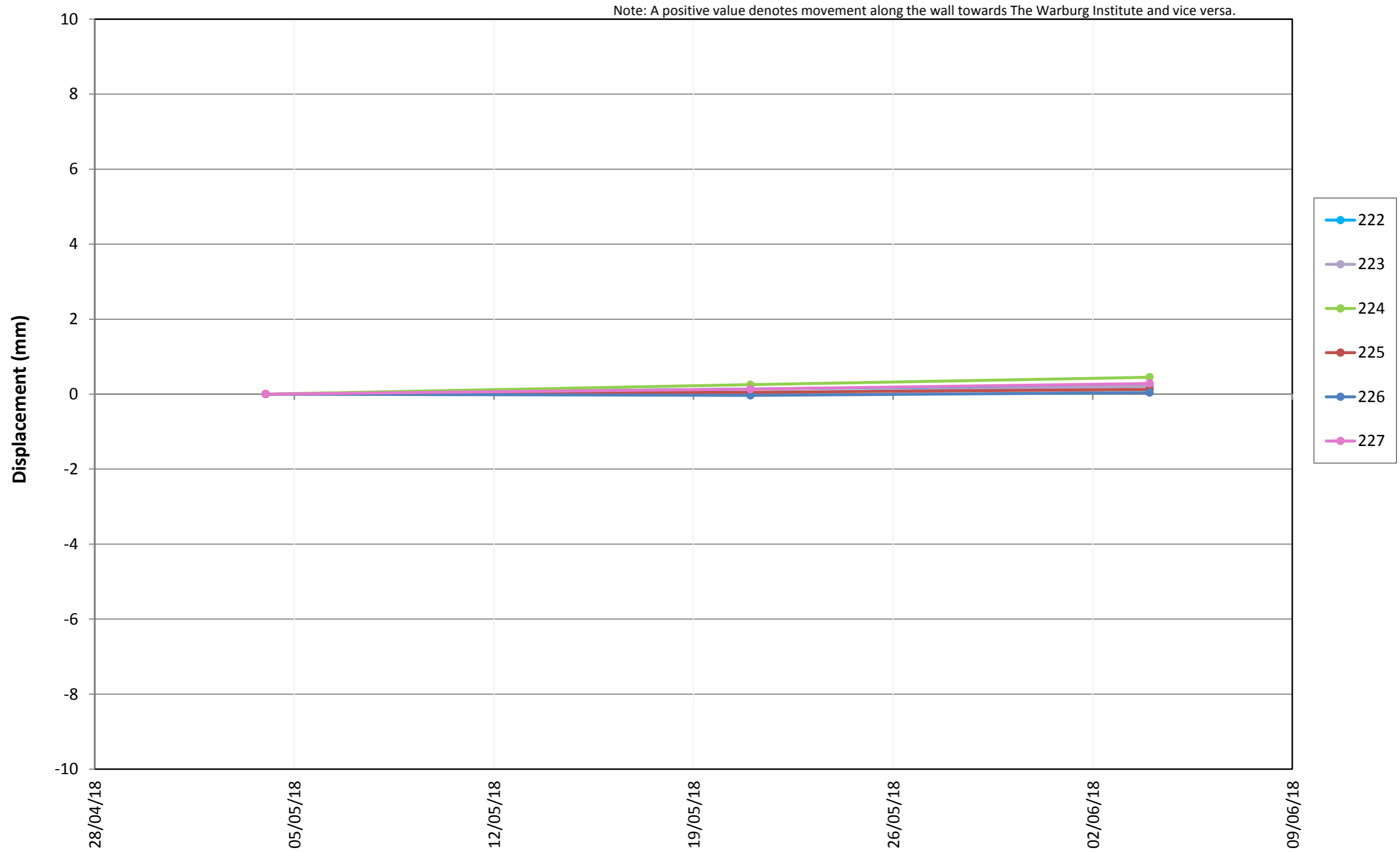
Note: A positive value denotes movement towards Slade Research Centre and vice versa.



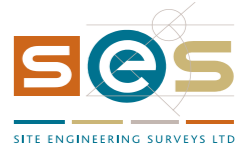
# Longitudinal Displacement Graph



Graph 05L - Targets on Staircase

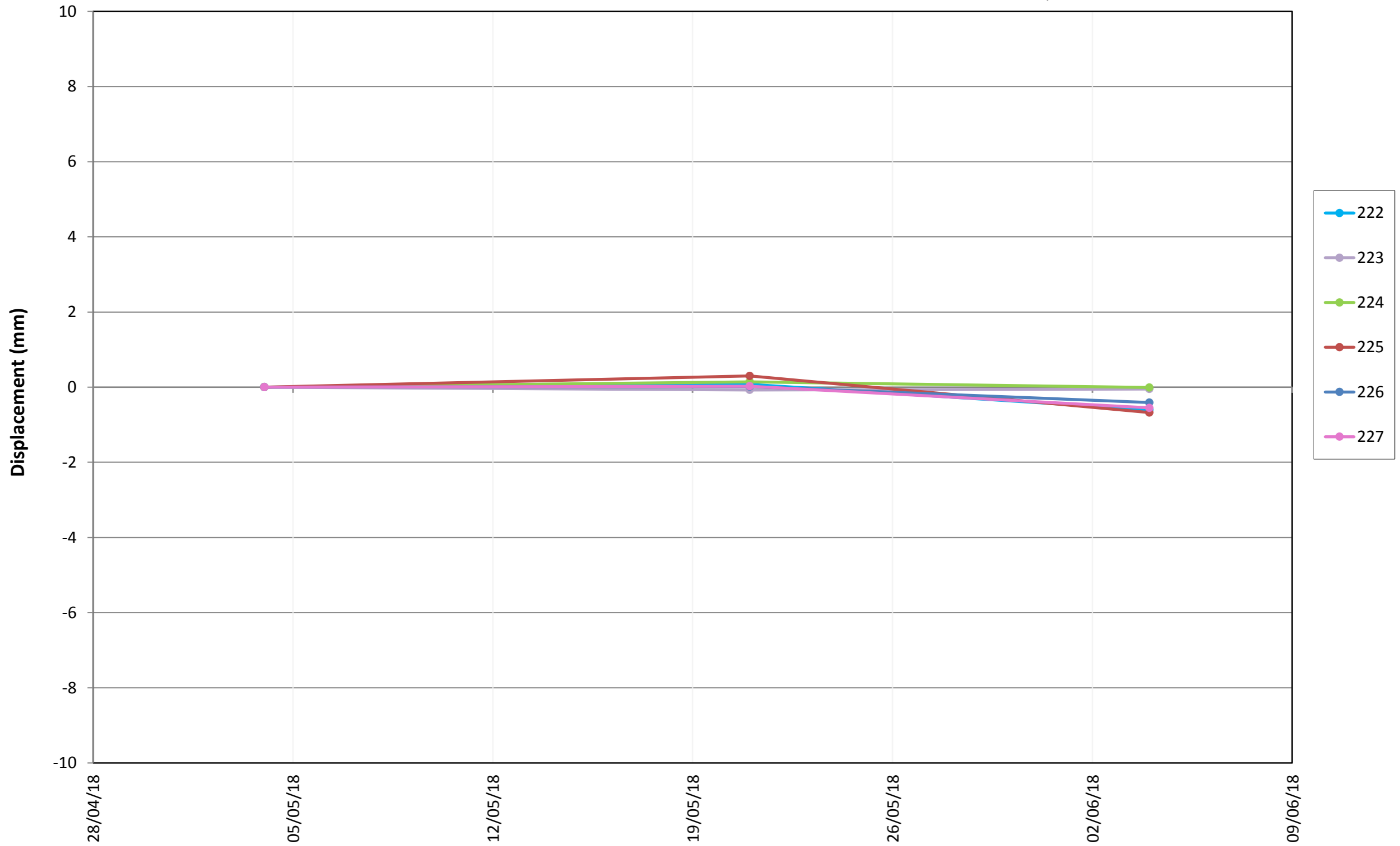


# Vertical Displacement Graph

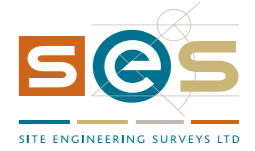


Graph 05V - Targets on Staircase

Note: +ve value denotes heave, -ve value denotes settlement.

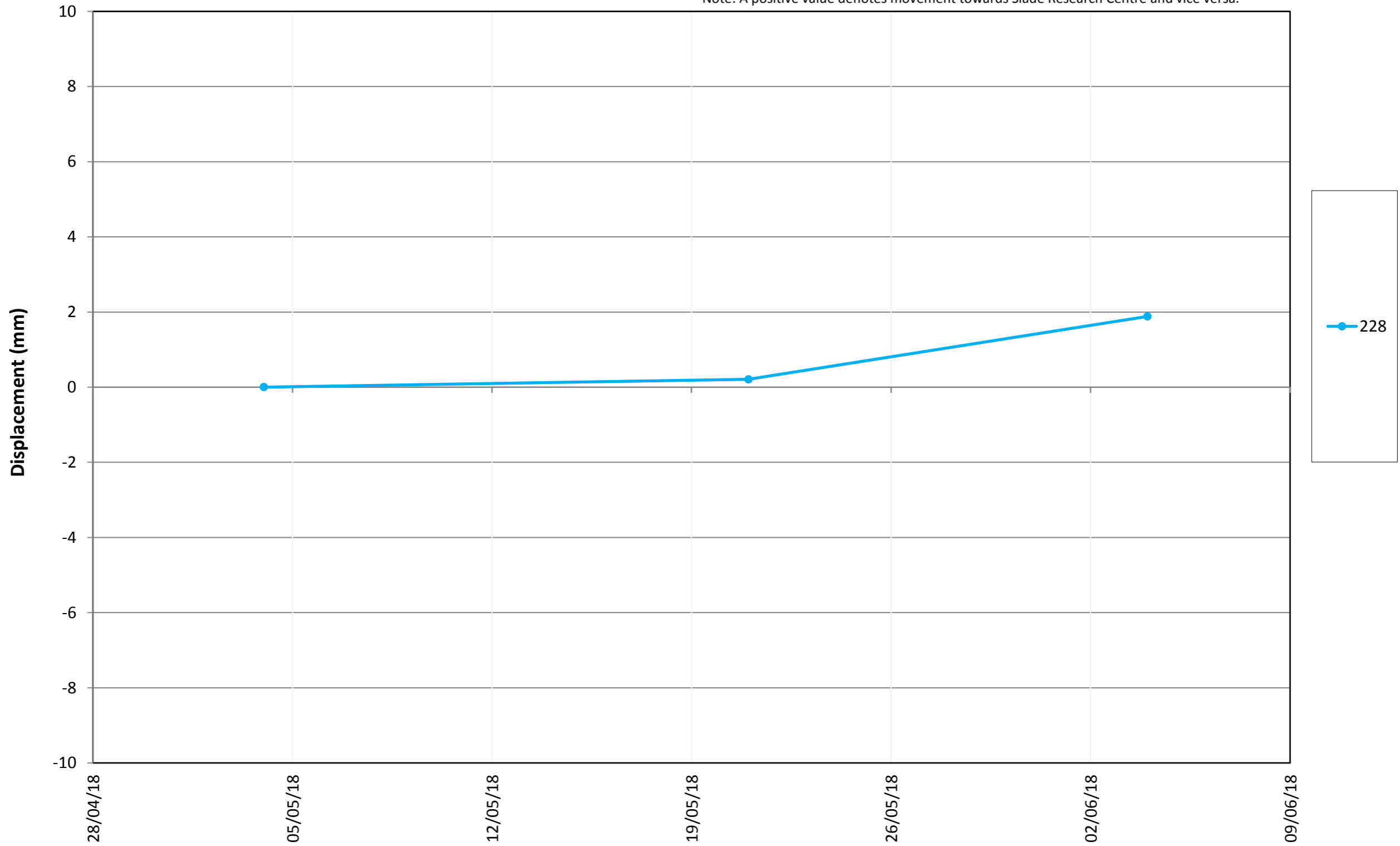


# Transverse Displacement Graph



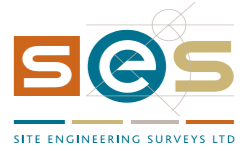
Graph 06T - Targets on back garden of No. 31 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.



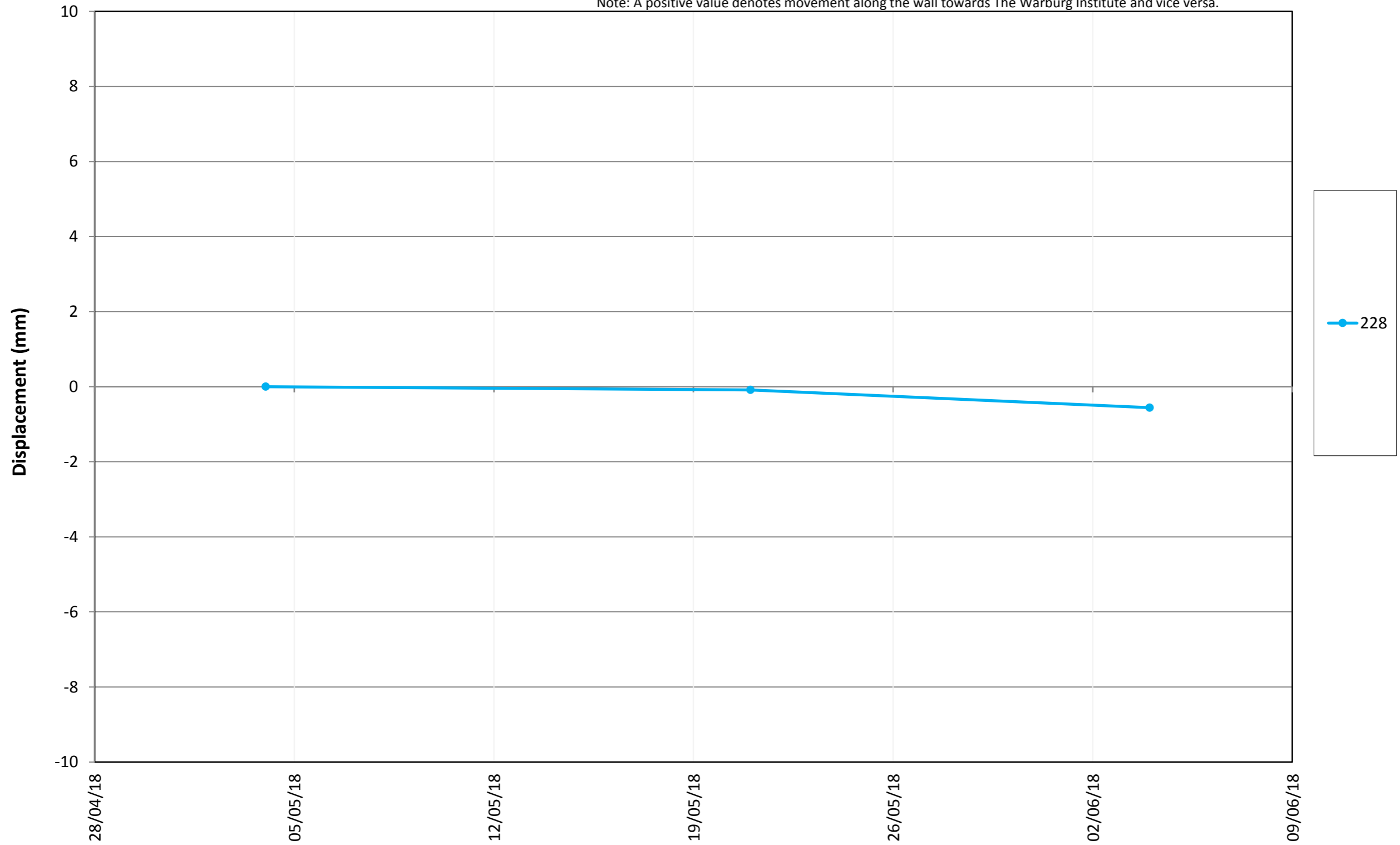


# Longitudinal Displacement Graph

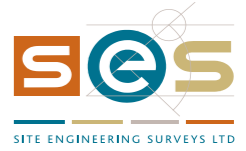


Graph 06L - Targets on back garden of No. 31 Torrington Square

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.

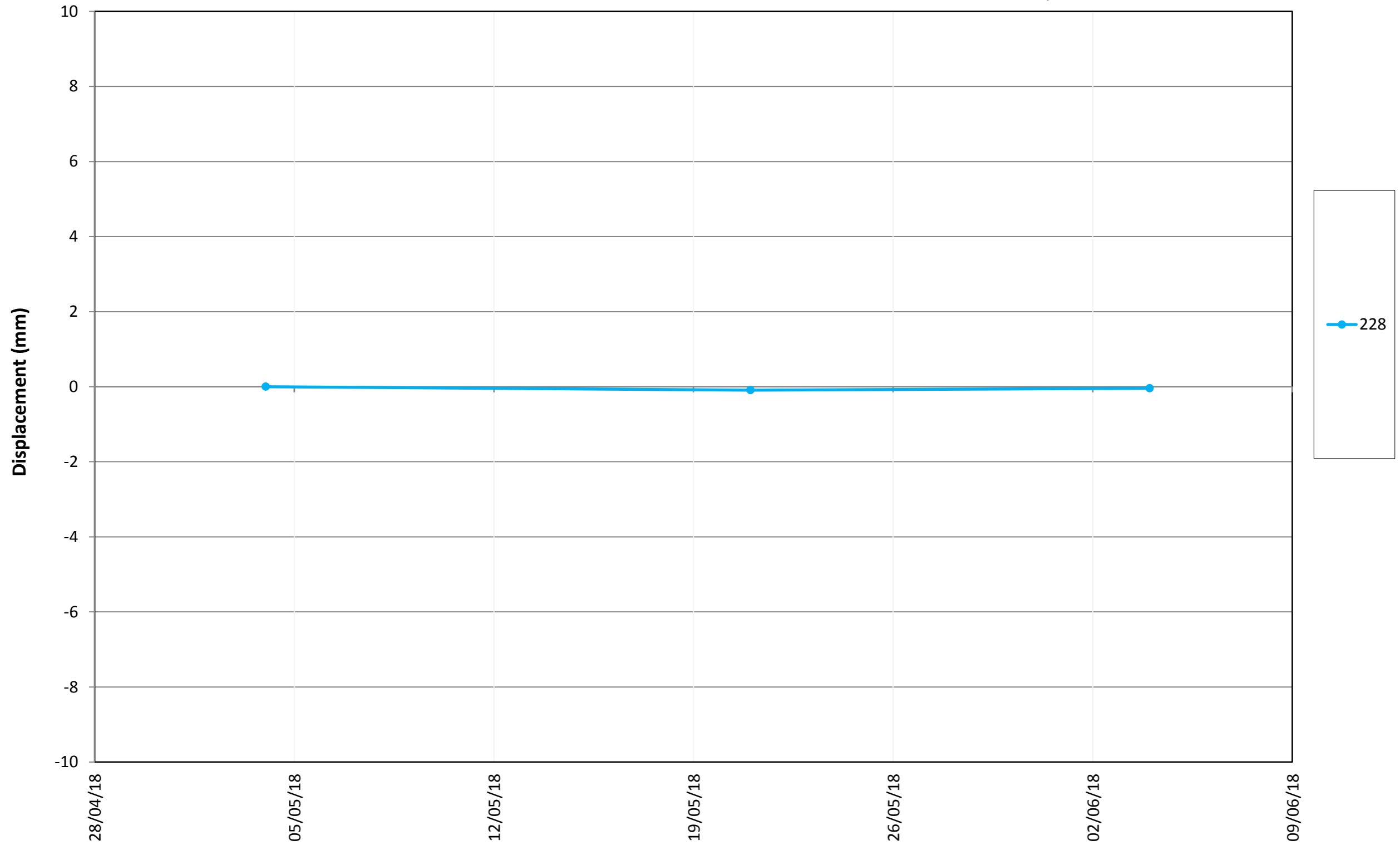


# Vertical Displacement Graph

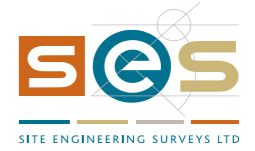


Graph 06V - Targets on back garden of No. 31 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

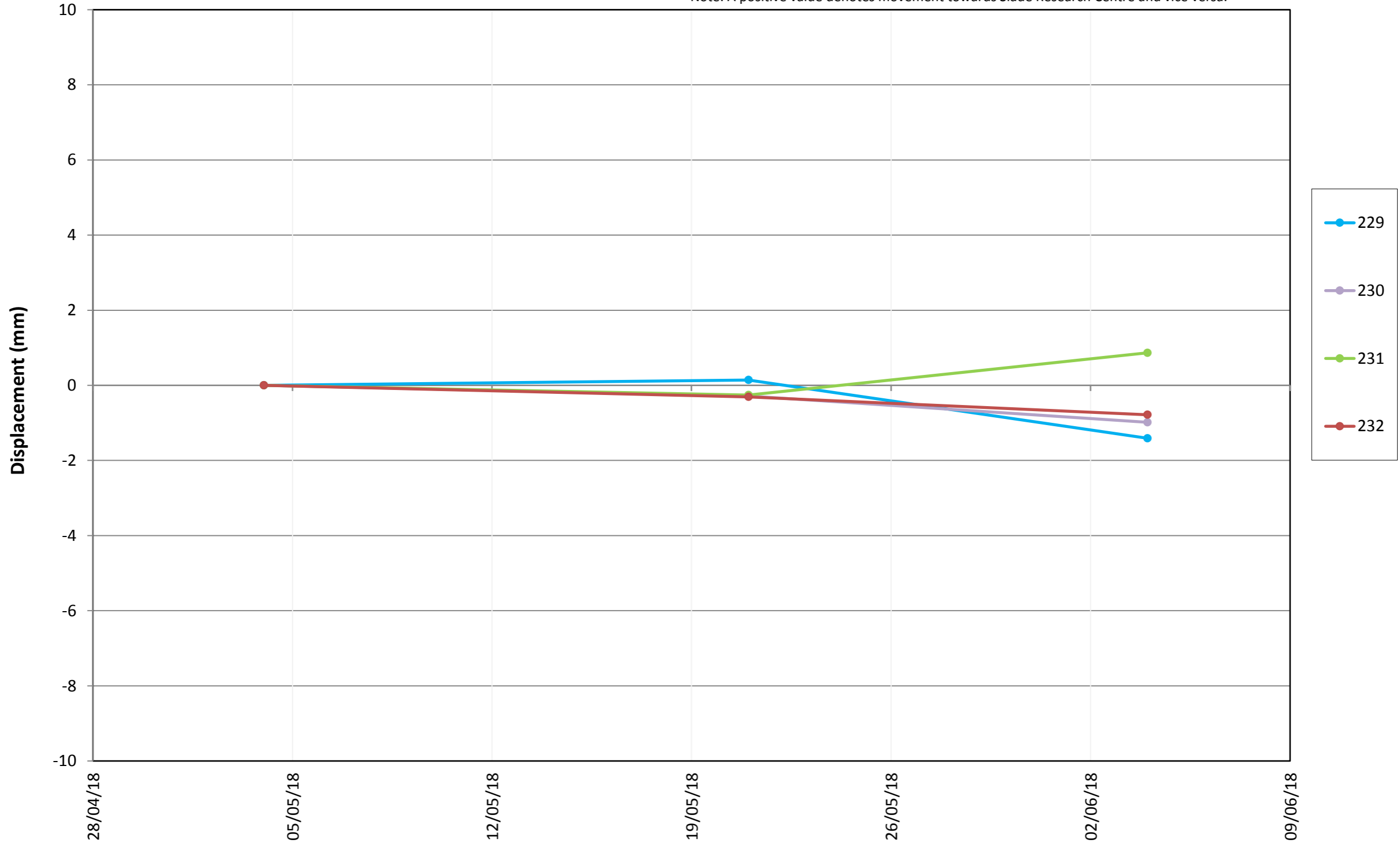


# Transverse Displacement Graph

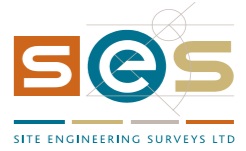


Graph 07T - Targets on back garden of No. 32 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.

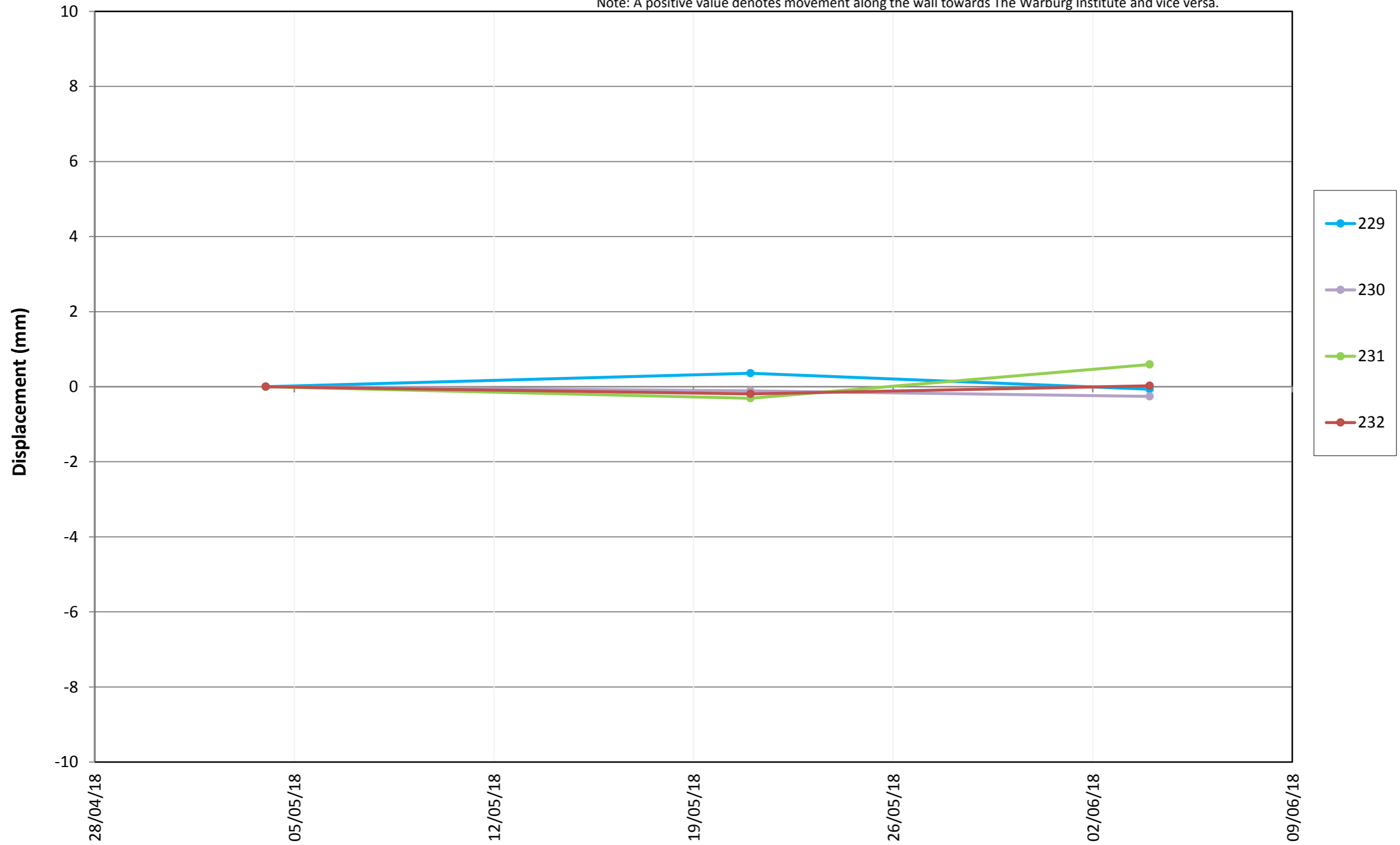


# Longitudinal Displacement Graph

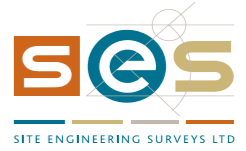


Graph 07L - Targets on back garden of No. 32 Torrington Square

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.

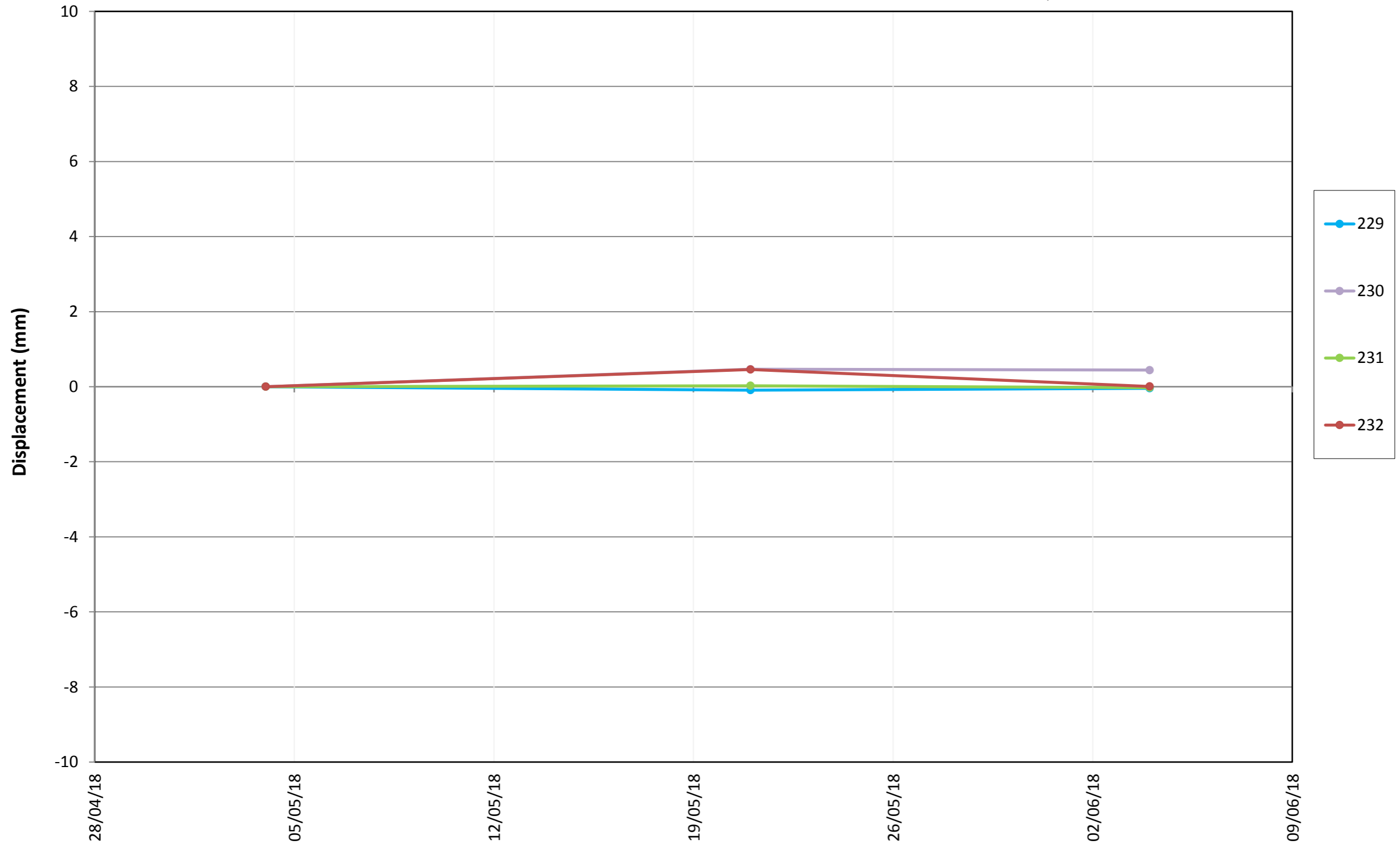


# Vertical Displacement Graph

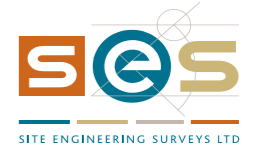


Graph 07V - Targets on back garden of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

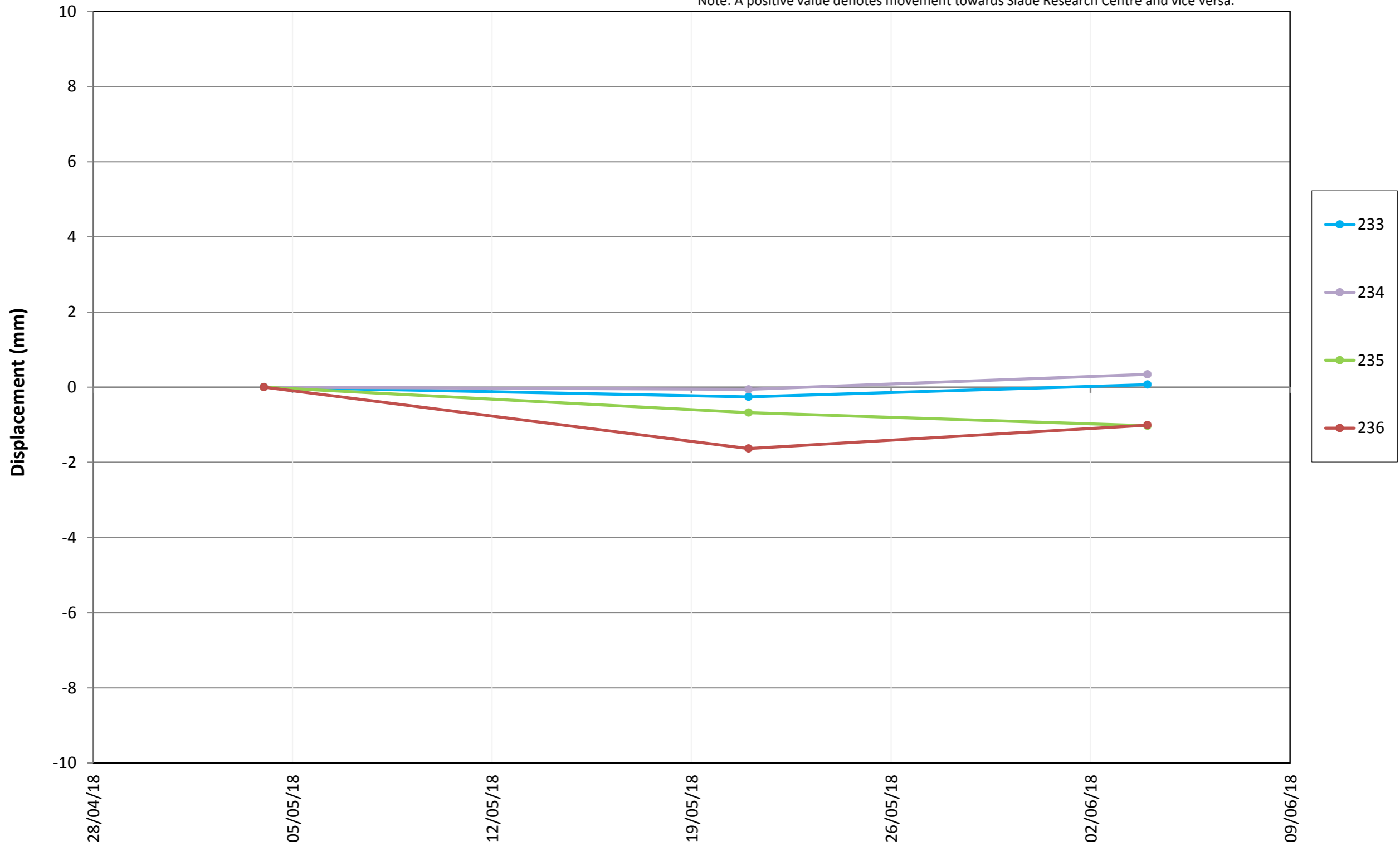


# Transverse Displacement Graph

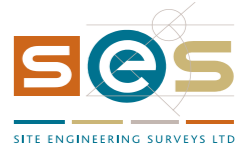


Graph 08T - Targets on Rear Elevation of No. 32 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.

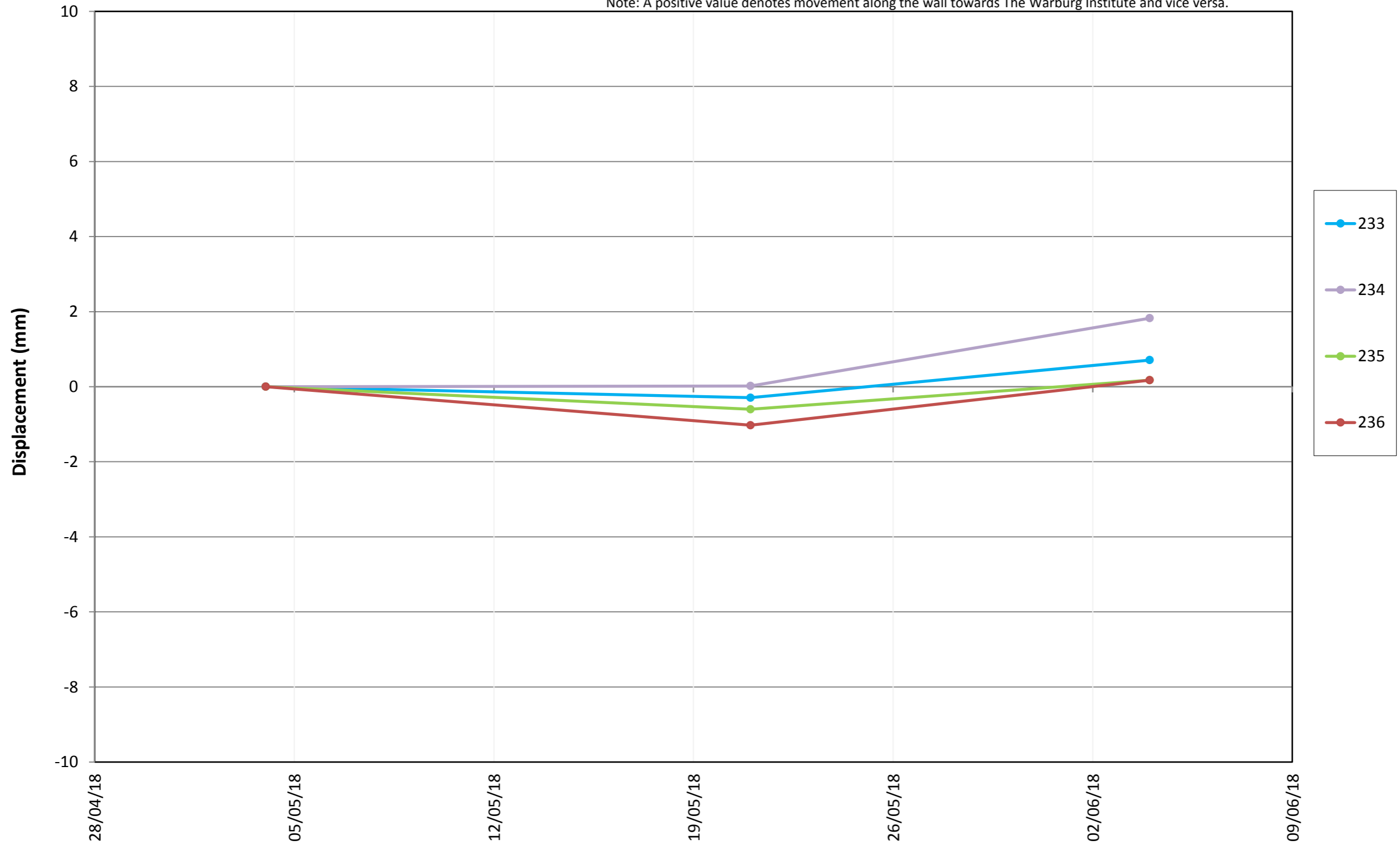


# Longitudinal Displacement Graph

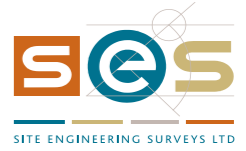


Graph 08L - Targets on Rear Elevation of No. 32 Torrington Square

Note: A positive value denotes movement along the wall towards The Warburg Institute and vice versa.

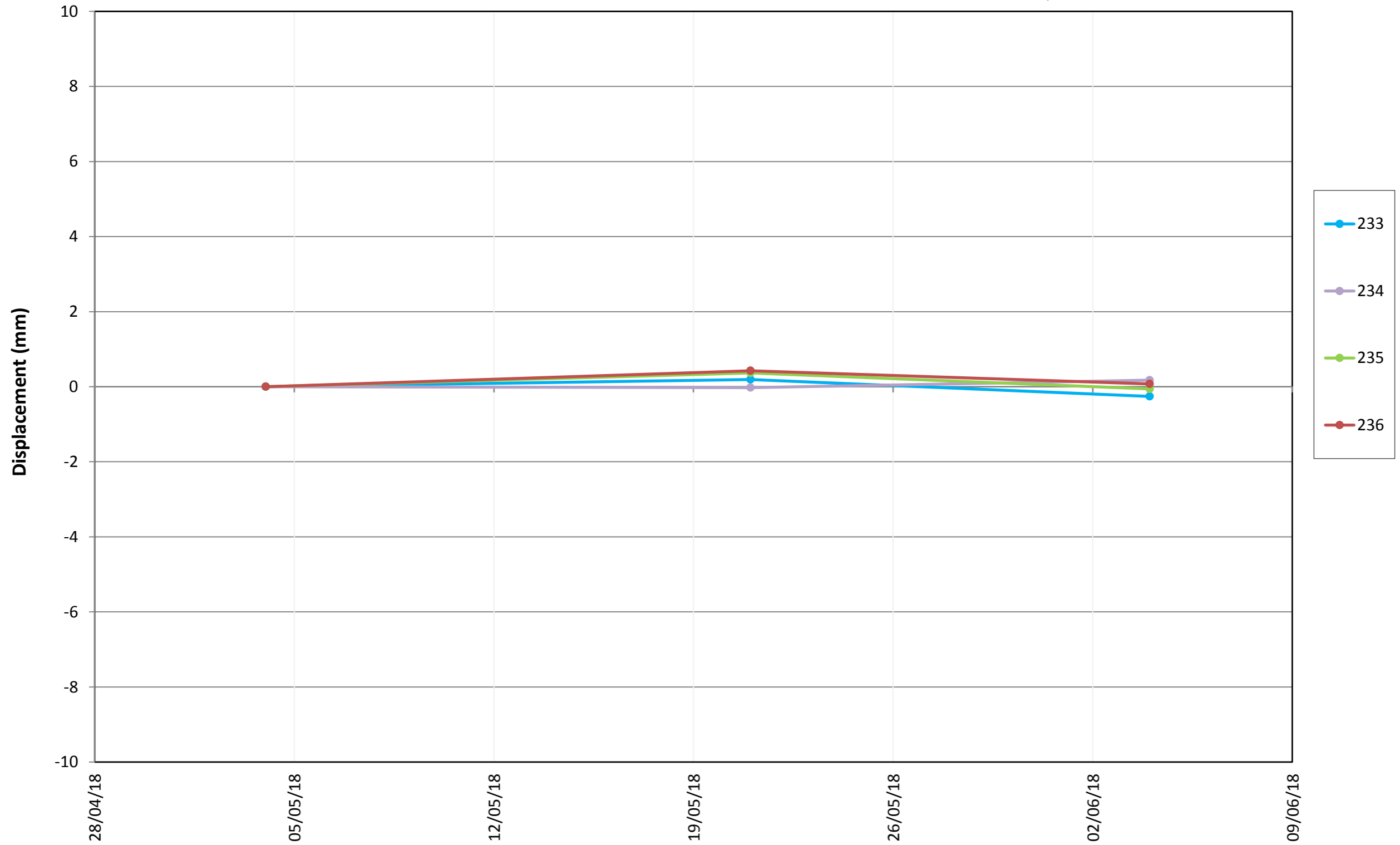


# Vertical Displacement Graph



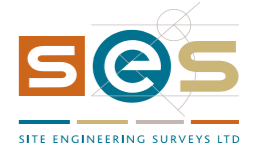
Graph 08V - Targets on Rear Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.



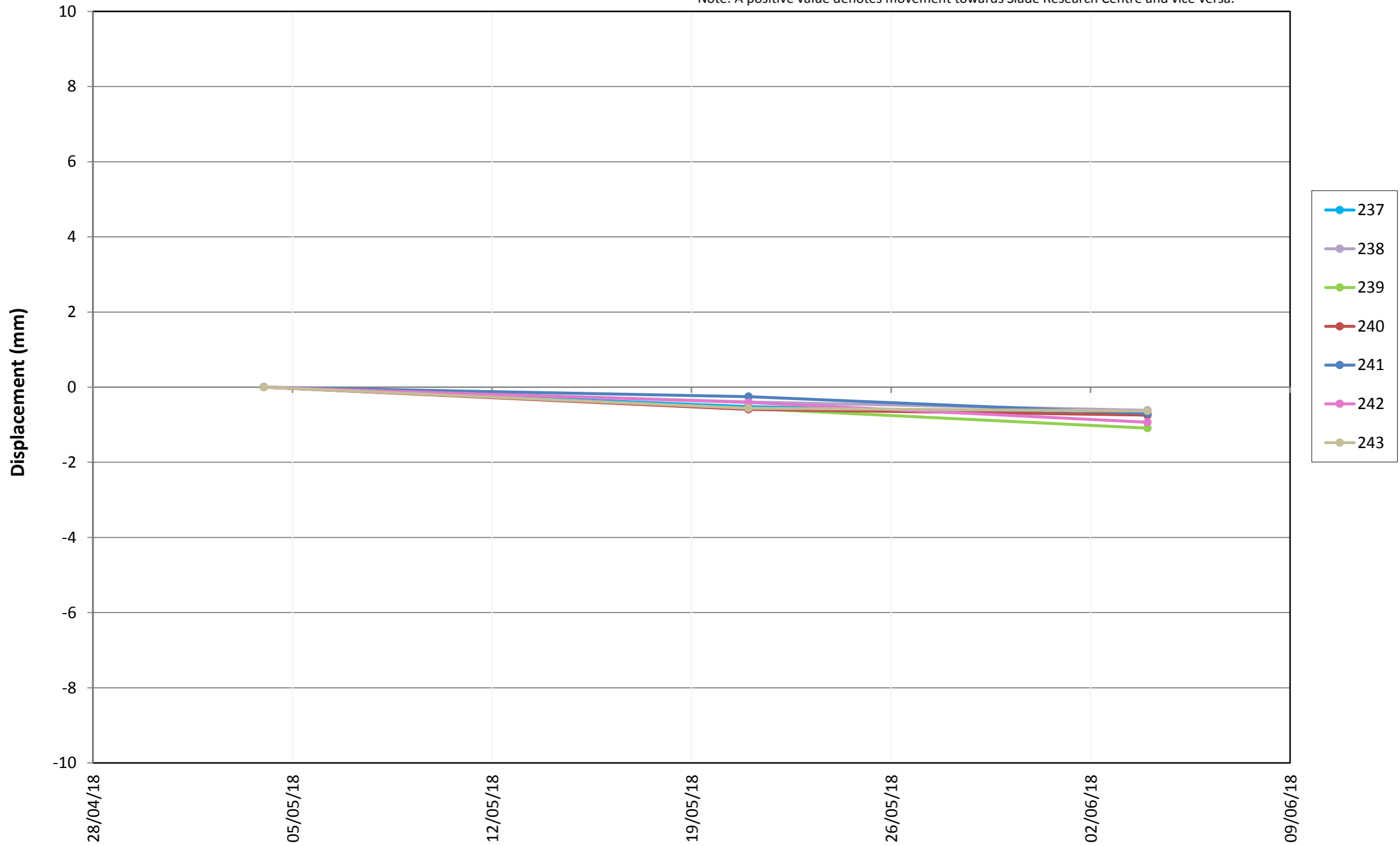


# Transverse Displacement Graph

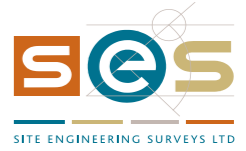


Graph 09T - Targets on Rear Elevation of No. 32 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.

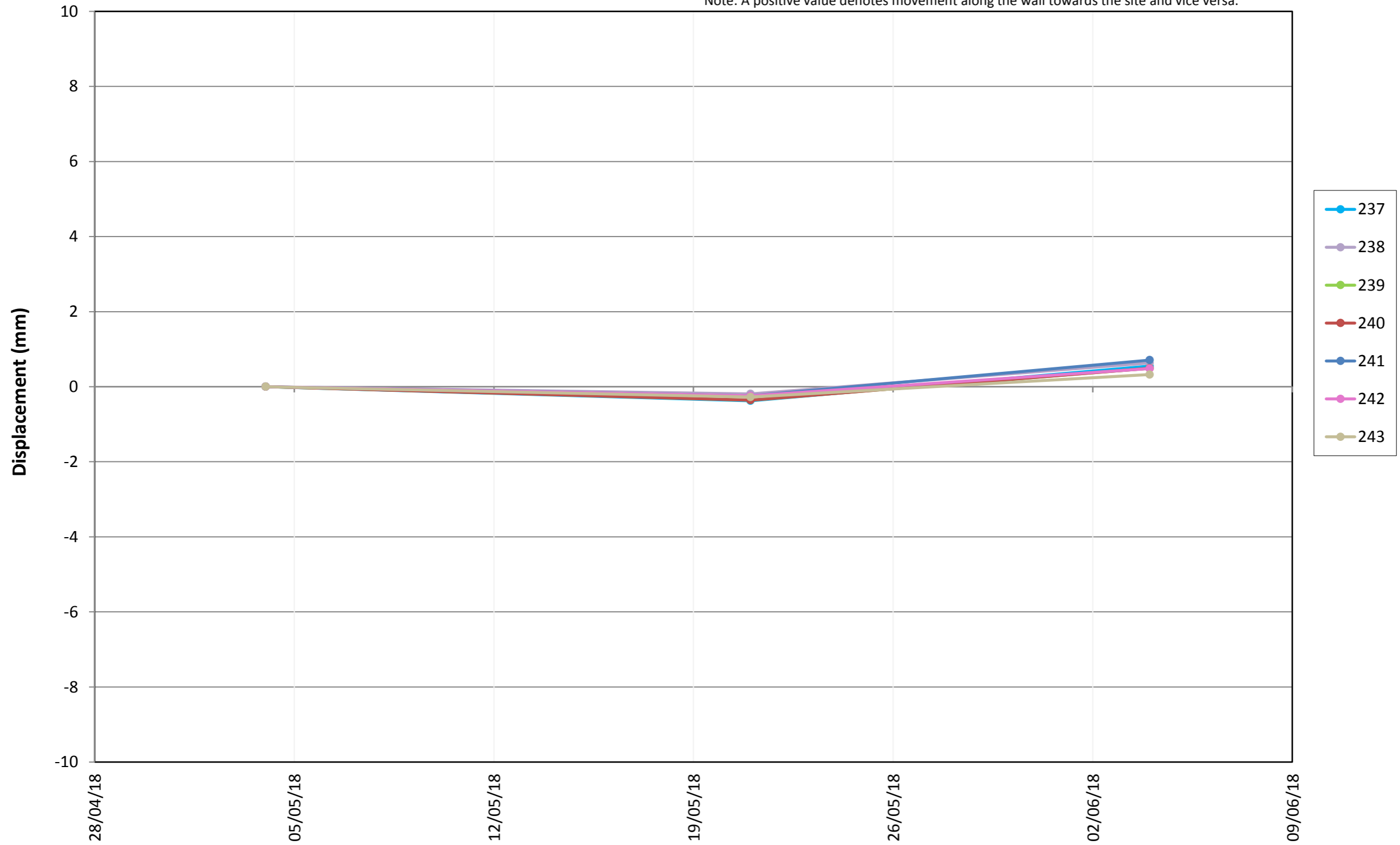


# Longitudinal Displacement Graph

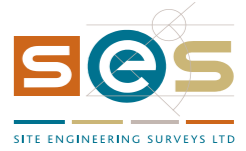


Graph 09L - Targets on Rear Elevation of No. 32 Torrington Square

Note: A positive value denotes movement along the wall towards the site and vice versa.

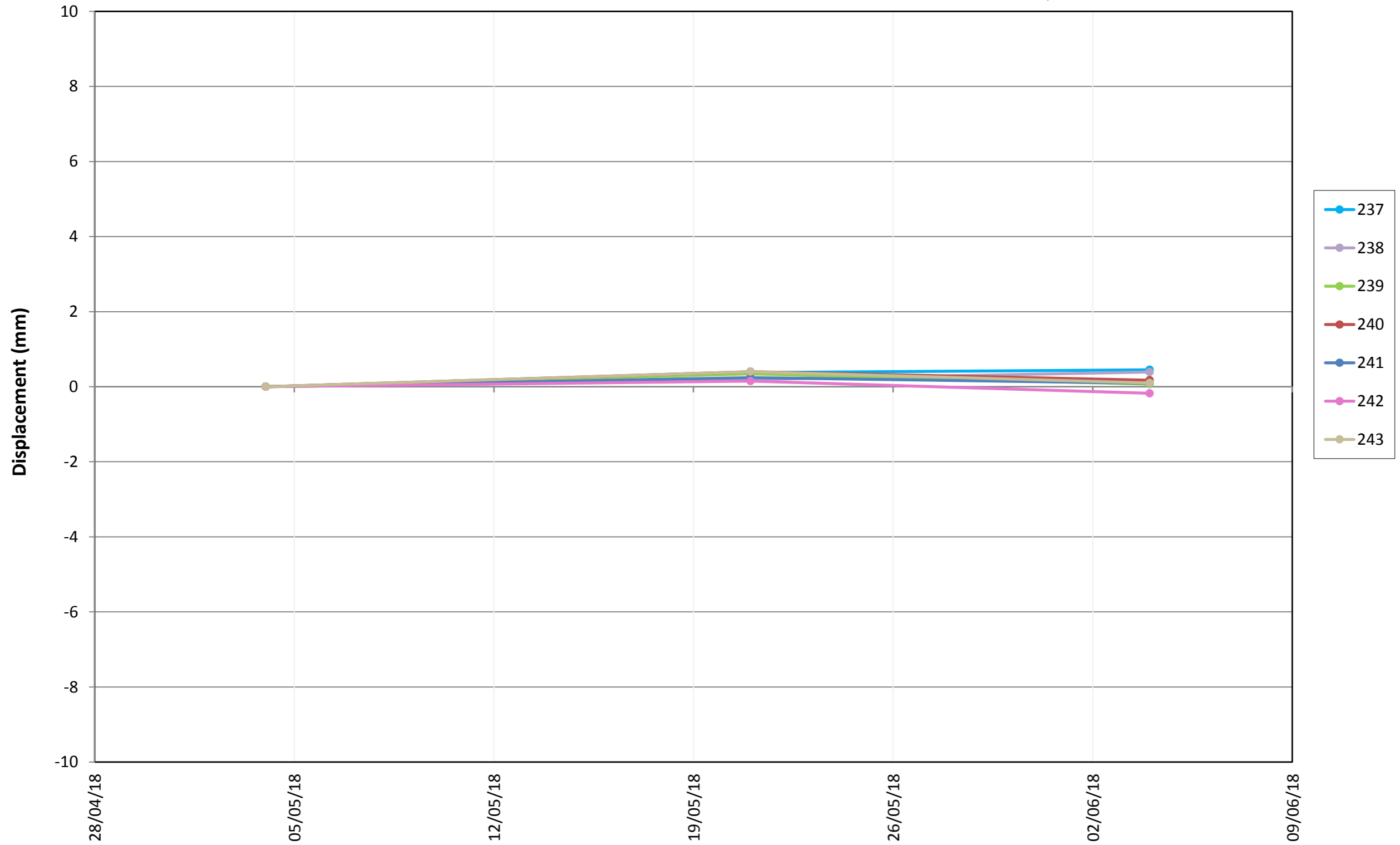


# Vertical Displacement Graph

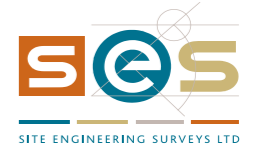


Graph 09V - Targets on Rear Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

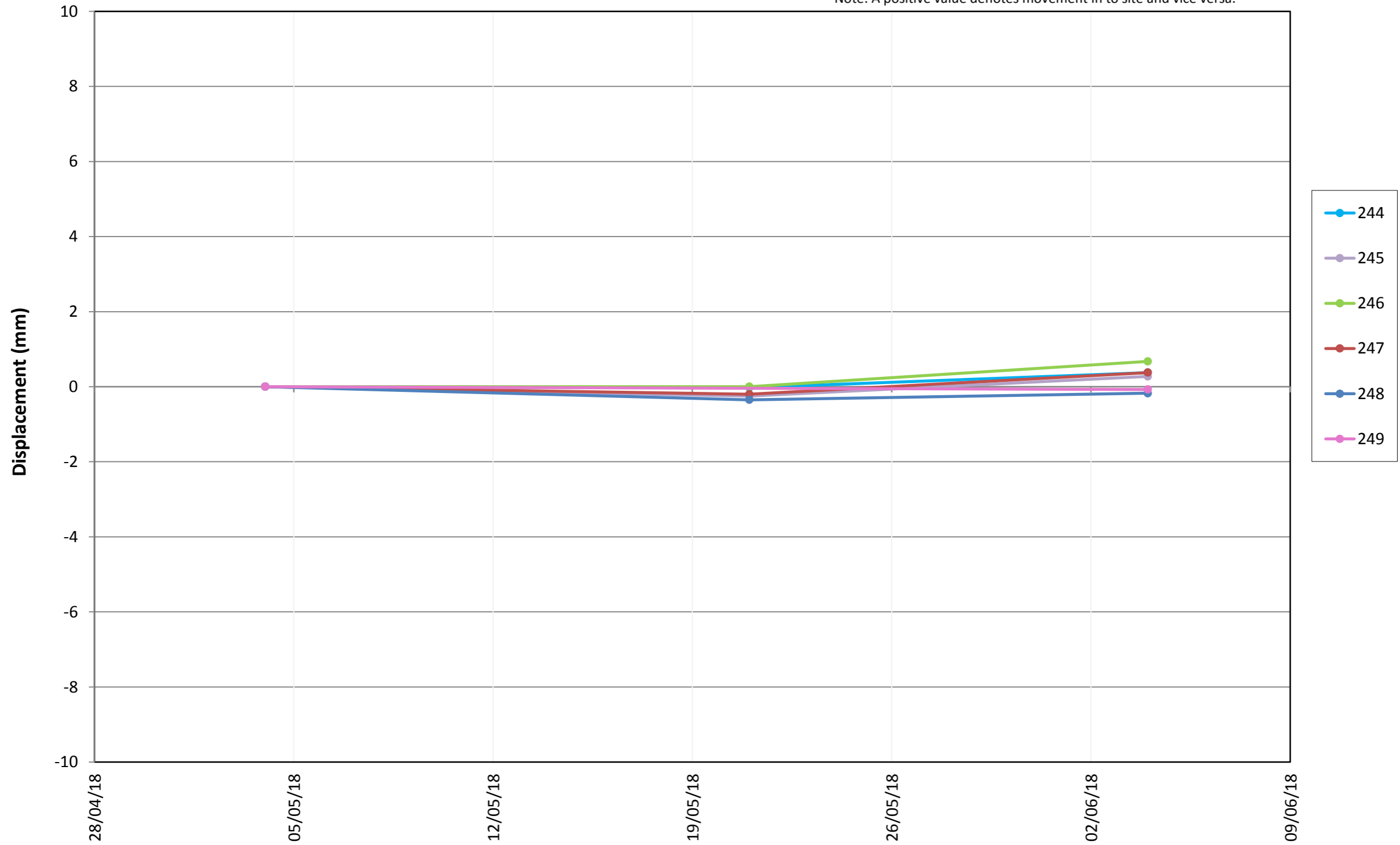


# Transverse Displacement Graph

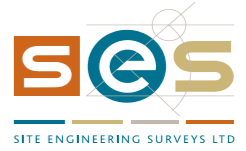


Graph 10T - Targets on Side Elevation of No. 32 Torrington Square

Note: A positive value denotes movement in to site and vice versa.

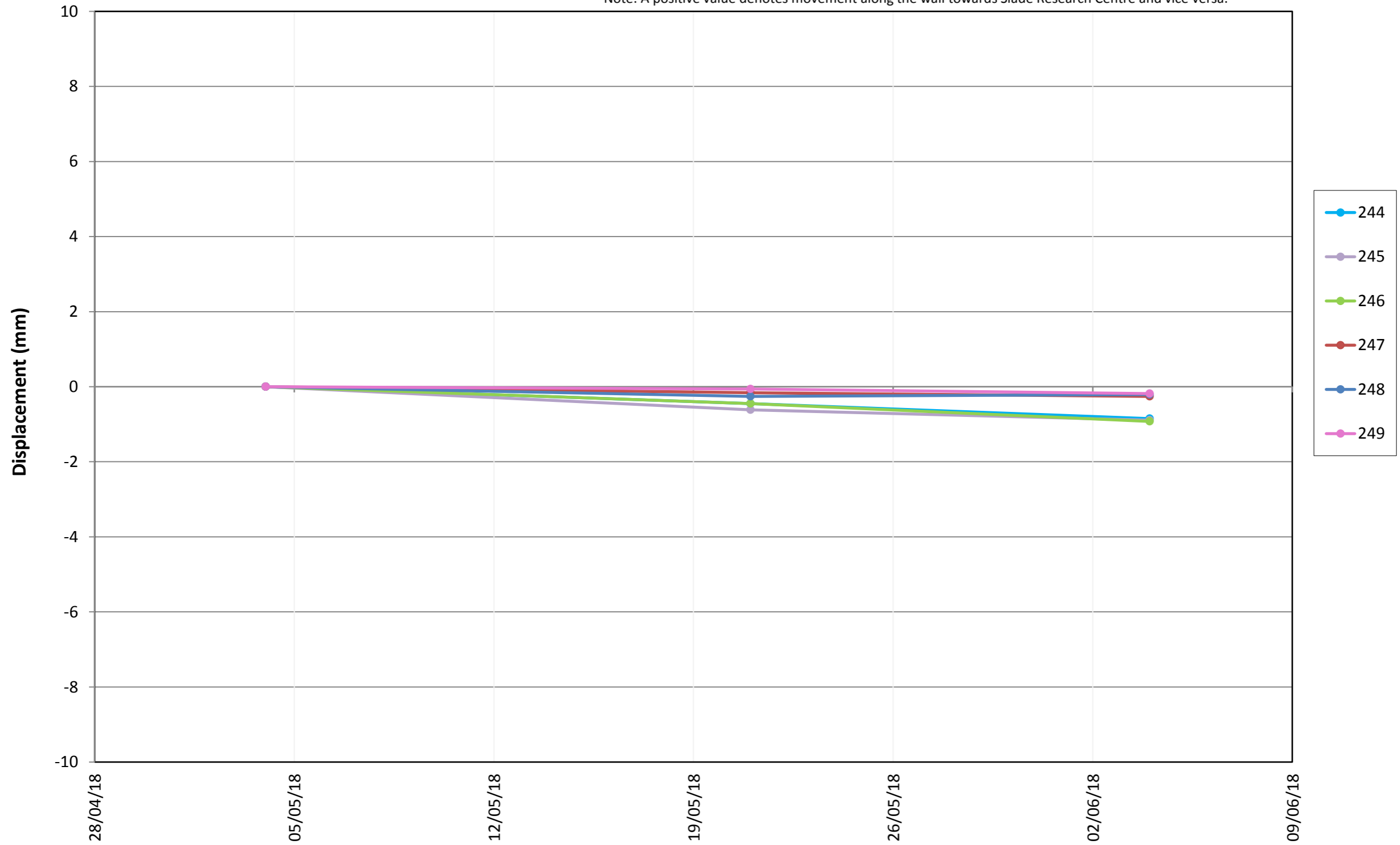


# Longitudinal Displacement Graph

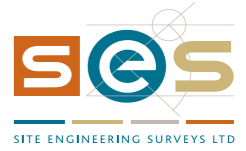


Graph 10L - Targets on Side Elevation of No. 32 Torrington Square

Note: A positive value denotes movement along the wall towards Slade Research Centre and vice versa.

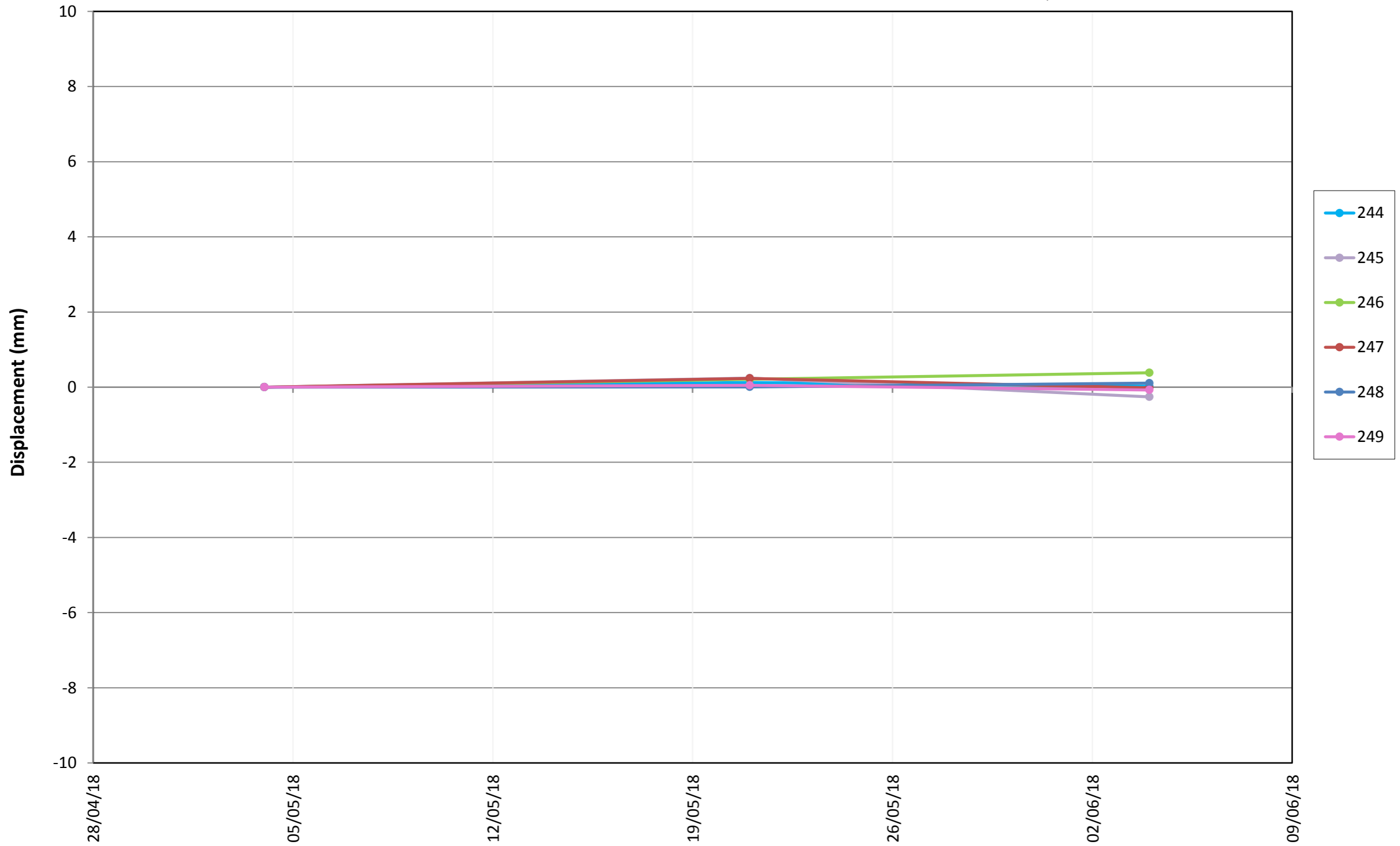


# Vertical Displacement Graph

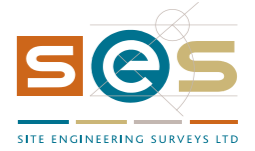


Graph 10V - Targets on Side Elevation of No. 32 Torrington Square

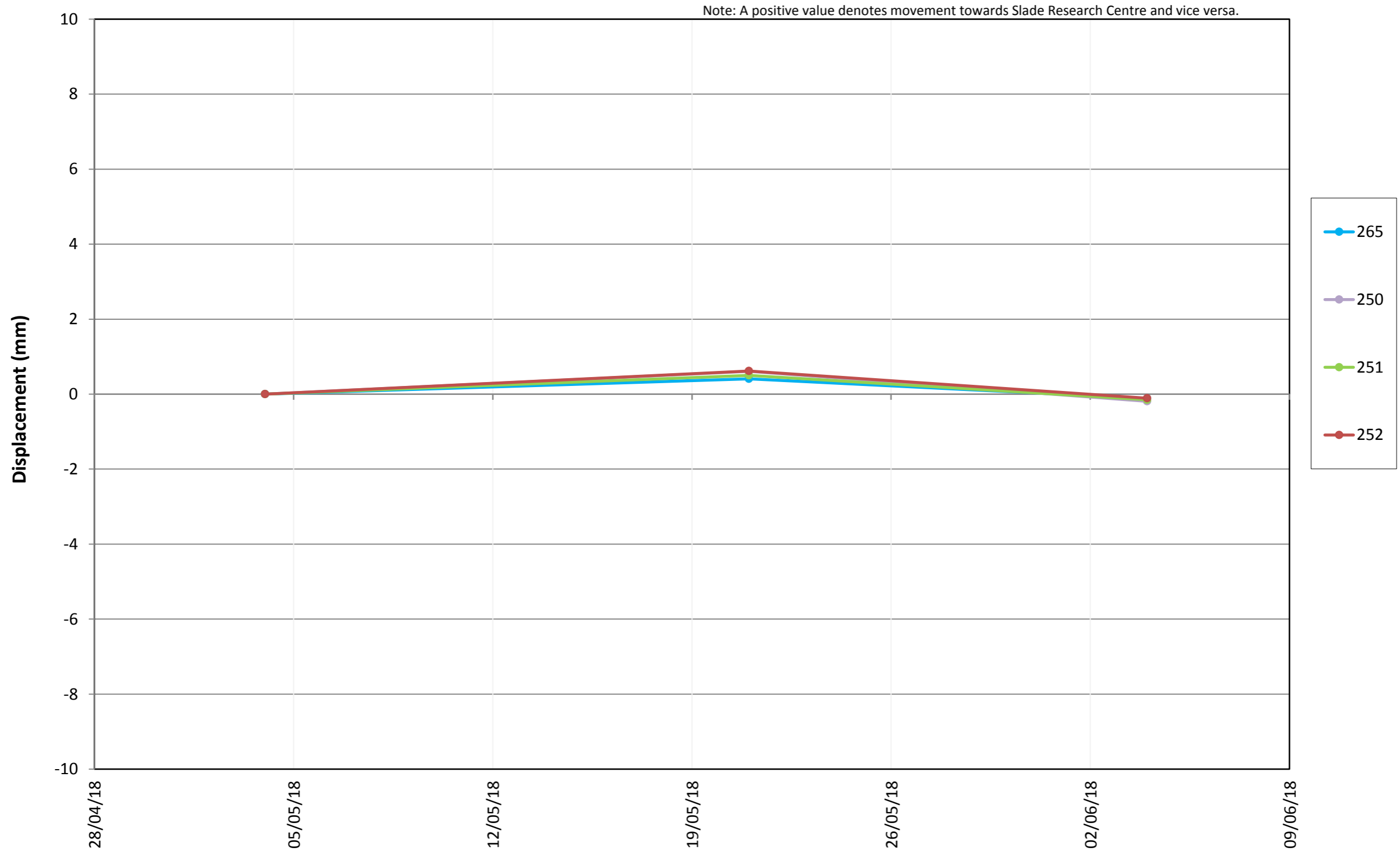
Note: +ve value denotes heave, -ve value denotes settlement.



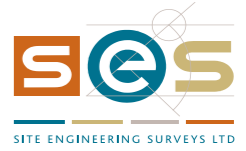
# Transverse Displacement Graph



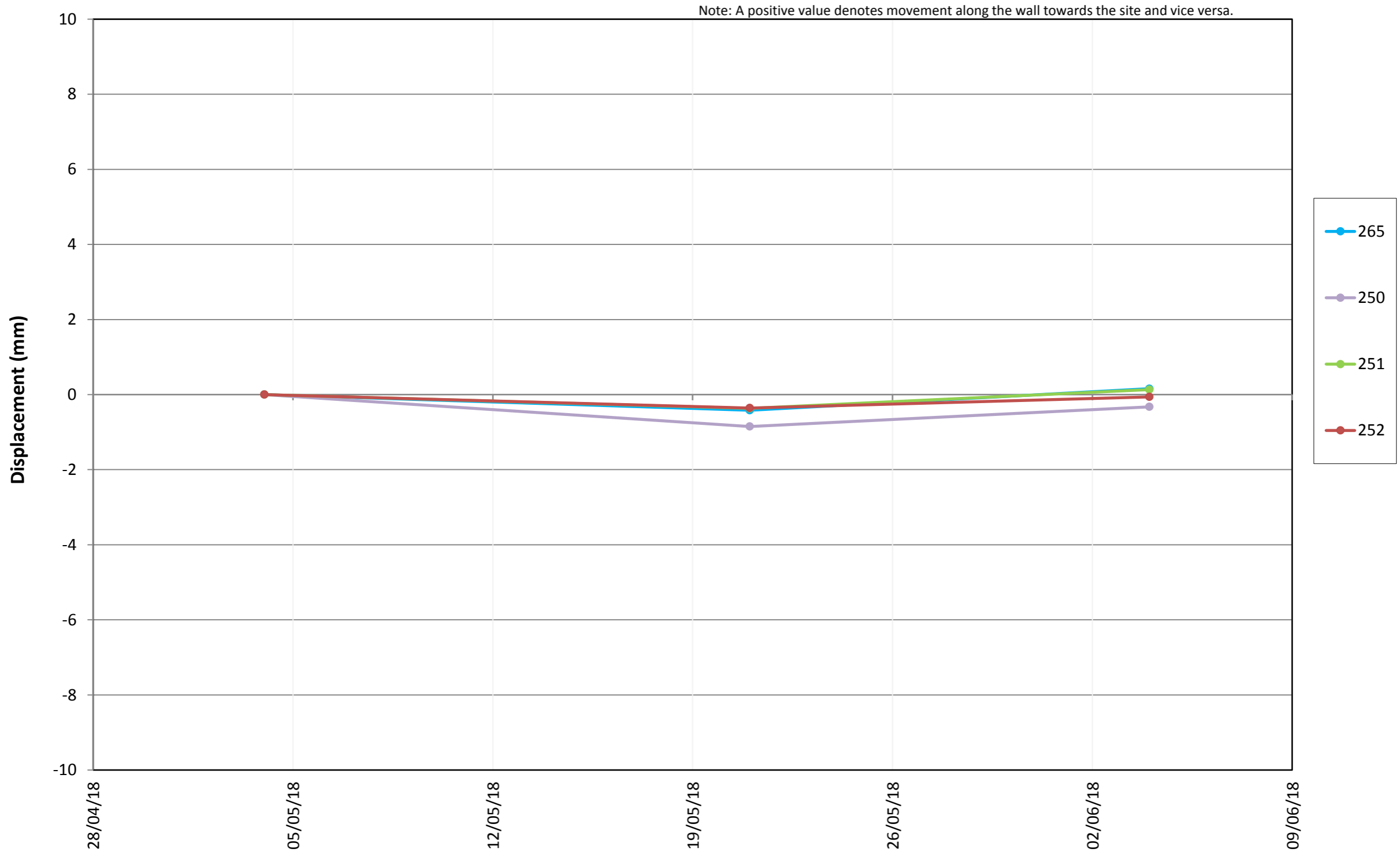
Graph 11T - Targets on Front Elevation of No. 32 Torrington Square



# Longitudinal Displacement Graph

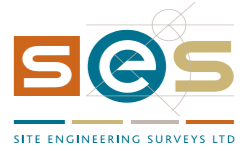


Graph 11L - Targets on Front Elevation of No. 32 Torrington Square



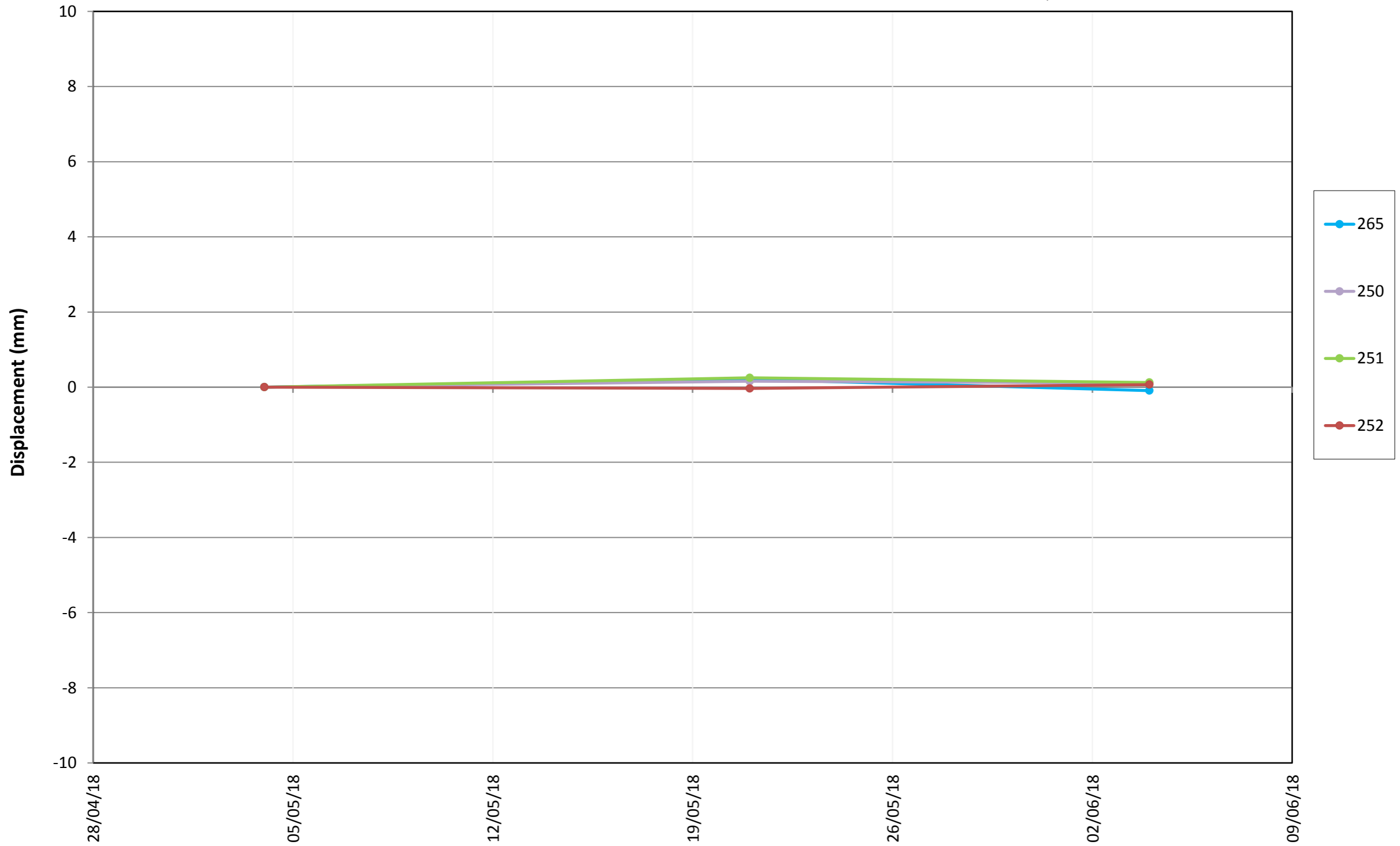


# Vertical Displacement Graph

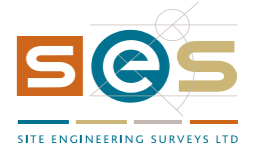


Graph 11V - Targets on Front Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

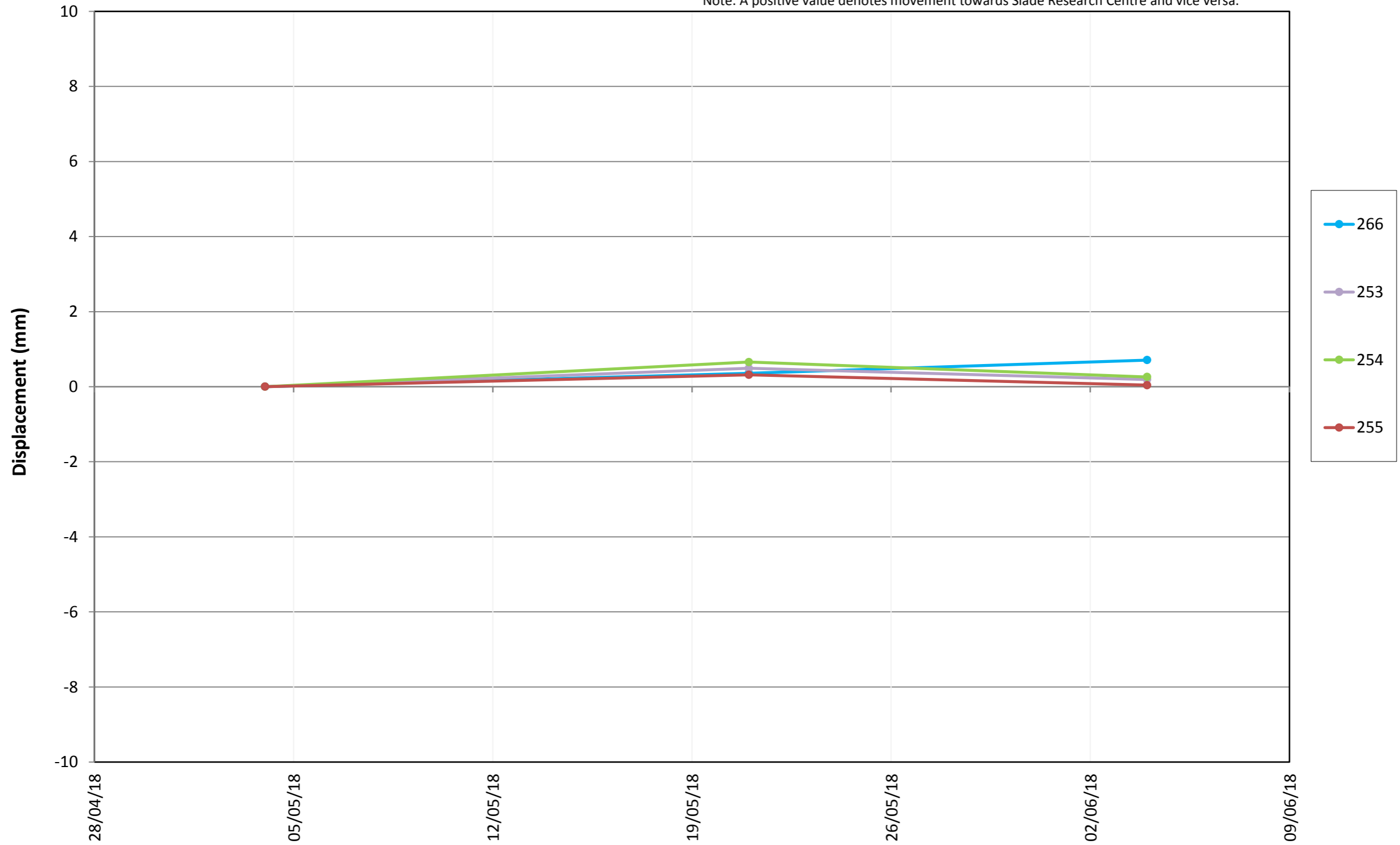


# Transverse Displacement Graph

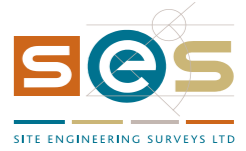


Graph 12T - Targets on Front Elevation of No. 32 Torrington Square

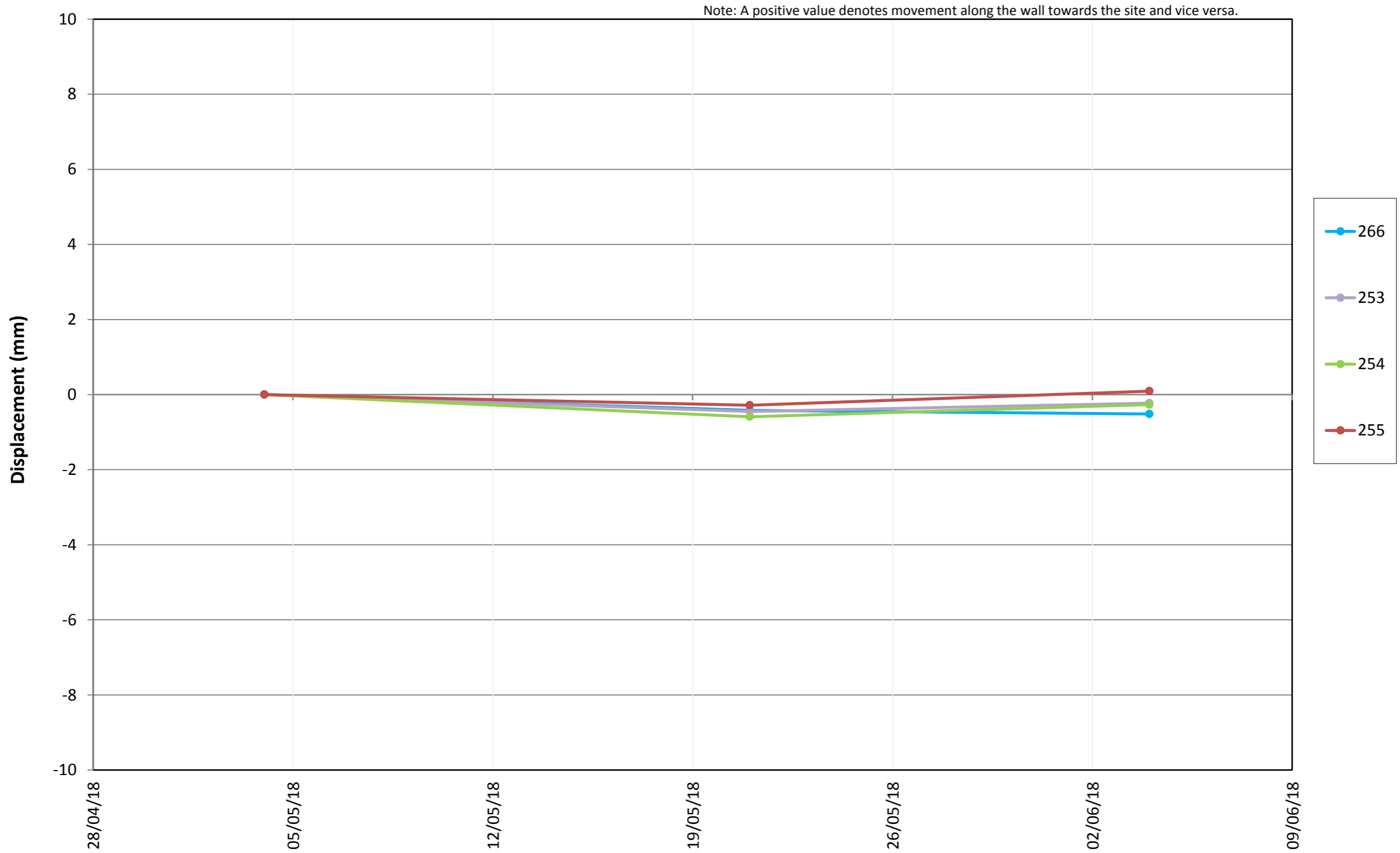
Note: A positive value denotes movement towards Slade Research Centre and vice versa.



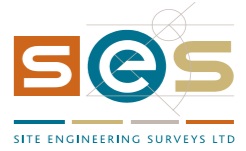
# Longitudinal Displacement Graph



Graph 12L - Targets on Front Elevation of No. 32 Torrington Square

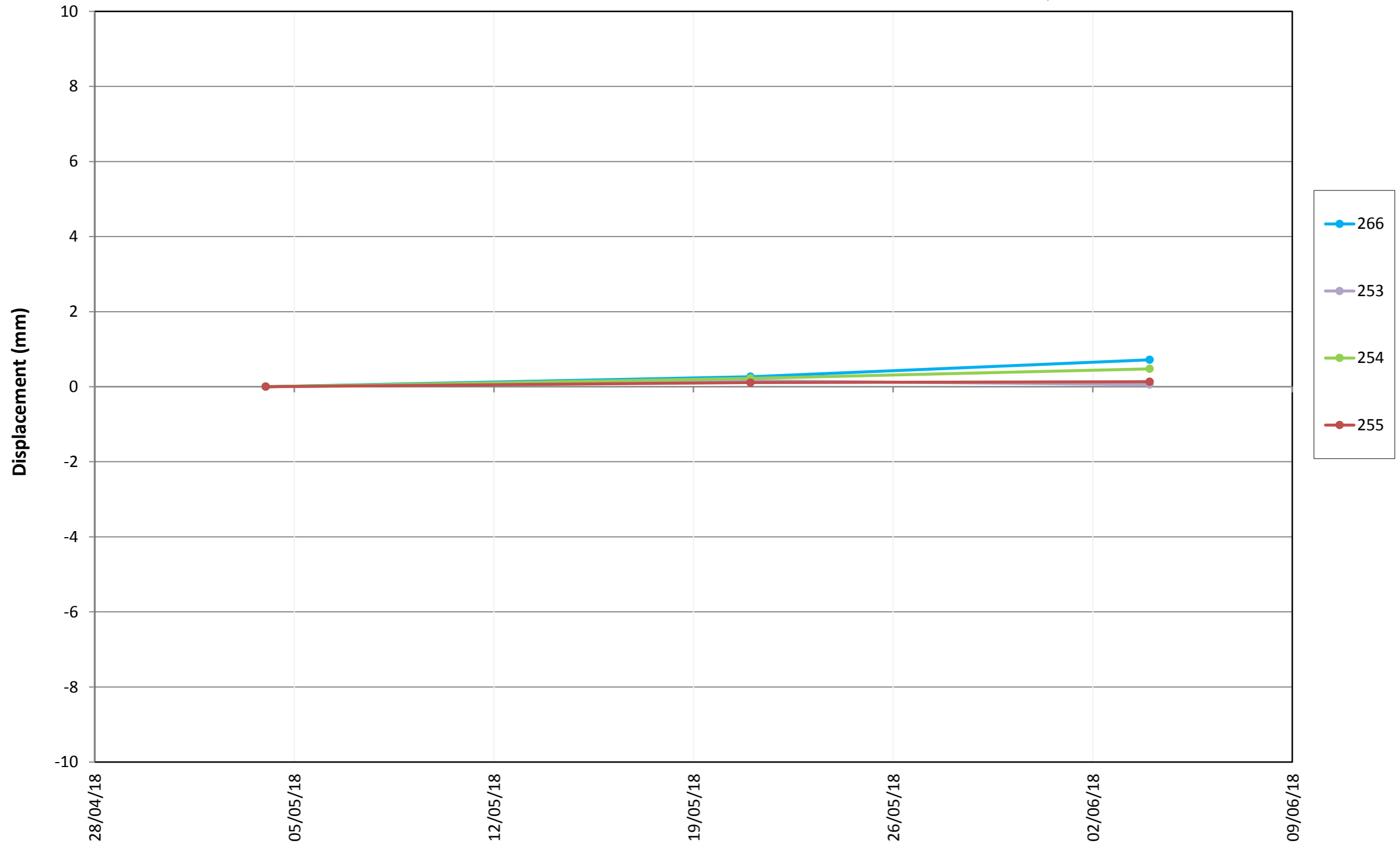


# Vertical Displacement Graph



Graph 12V - Targets on Front Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

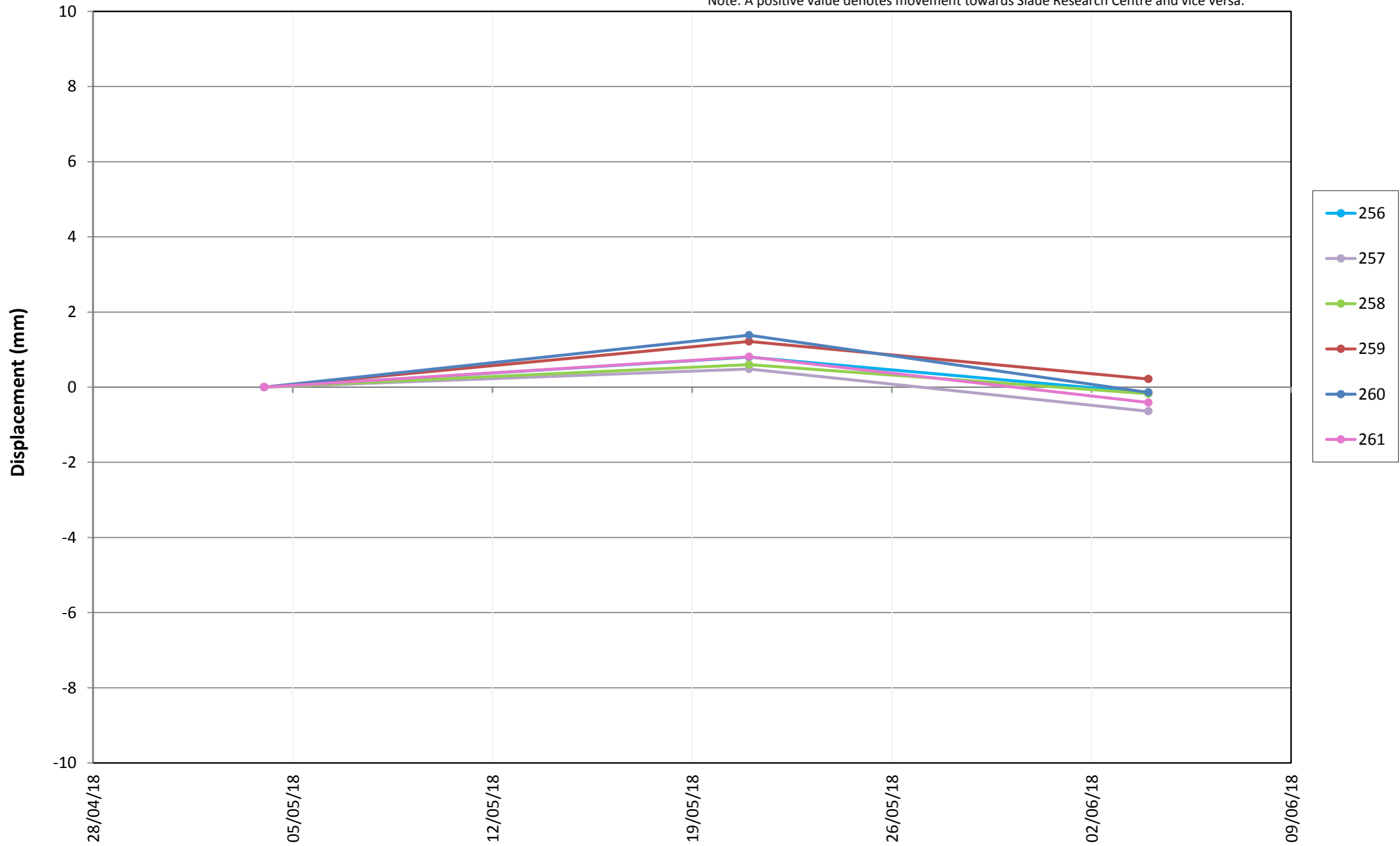


# Transverse Displacement Graph

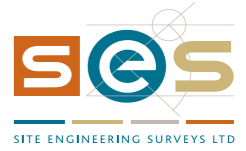


Graph 13T -Targets on Front Elevation of No. 31 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.

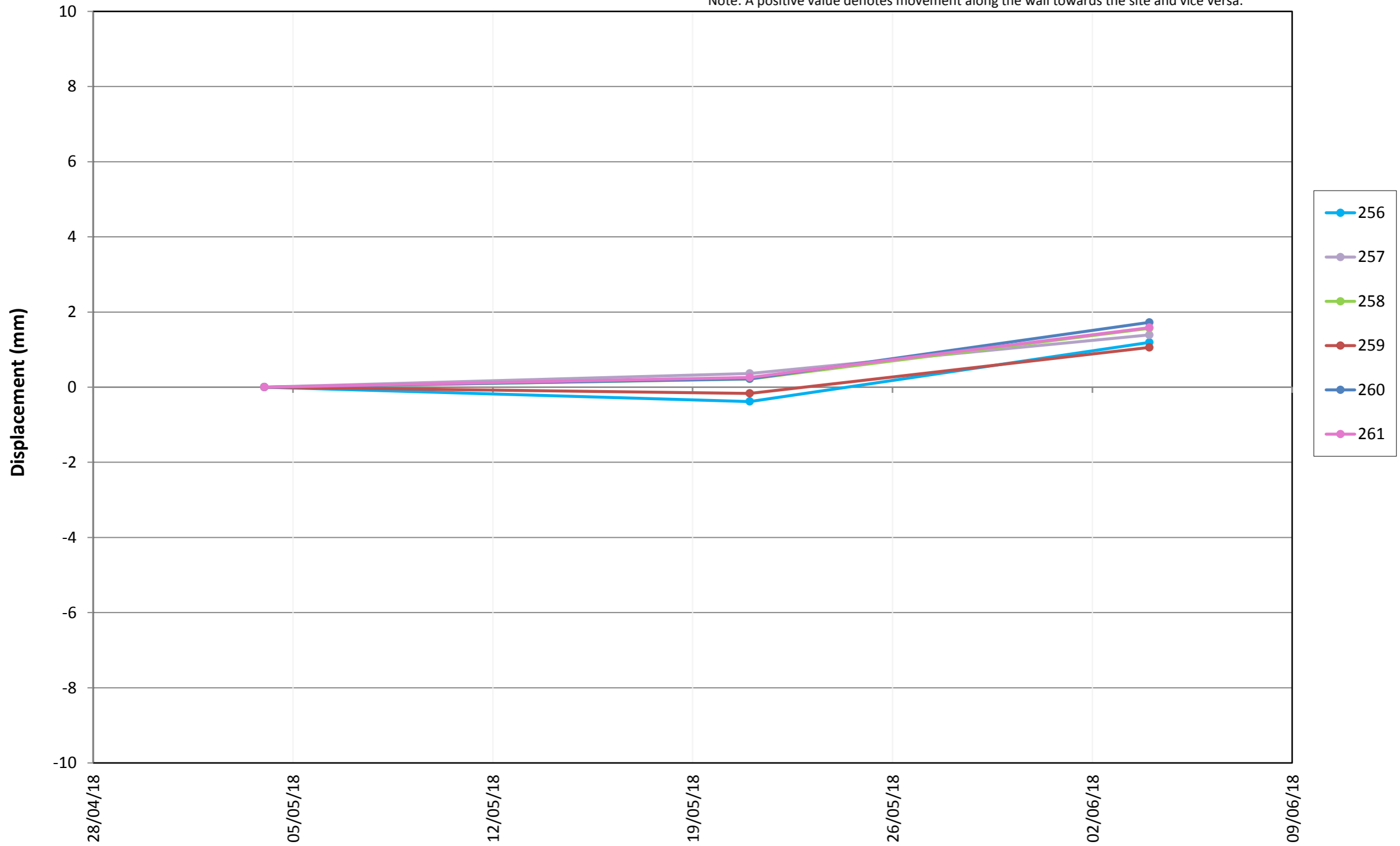


# Longitudinal Displacement Graph

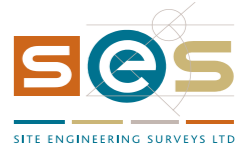


Graph 13L -Targets on Front Elevation of No. 31 Torrington Square

Note: A positive value denotes movement along the wall towards the site and vice versa.

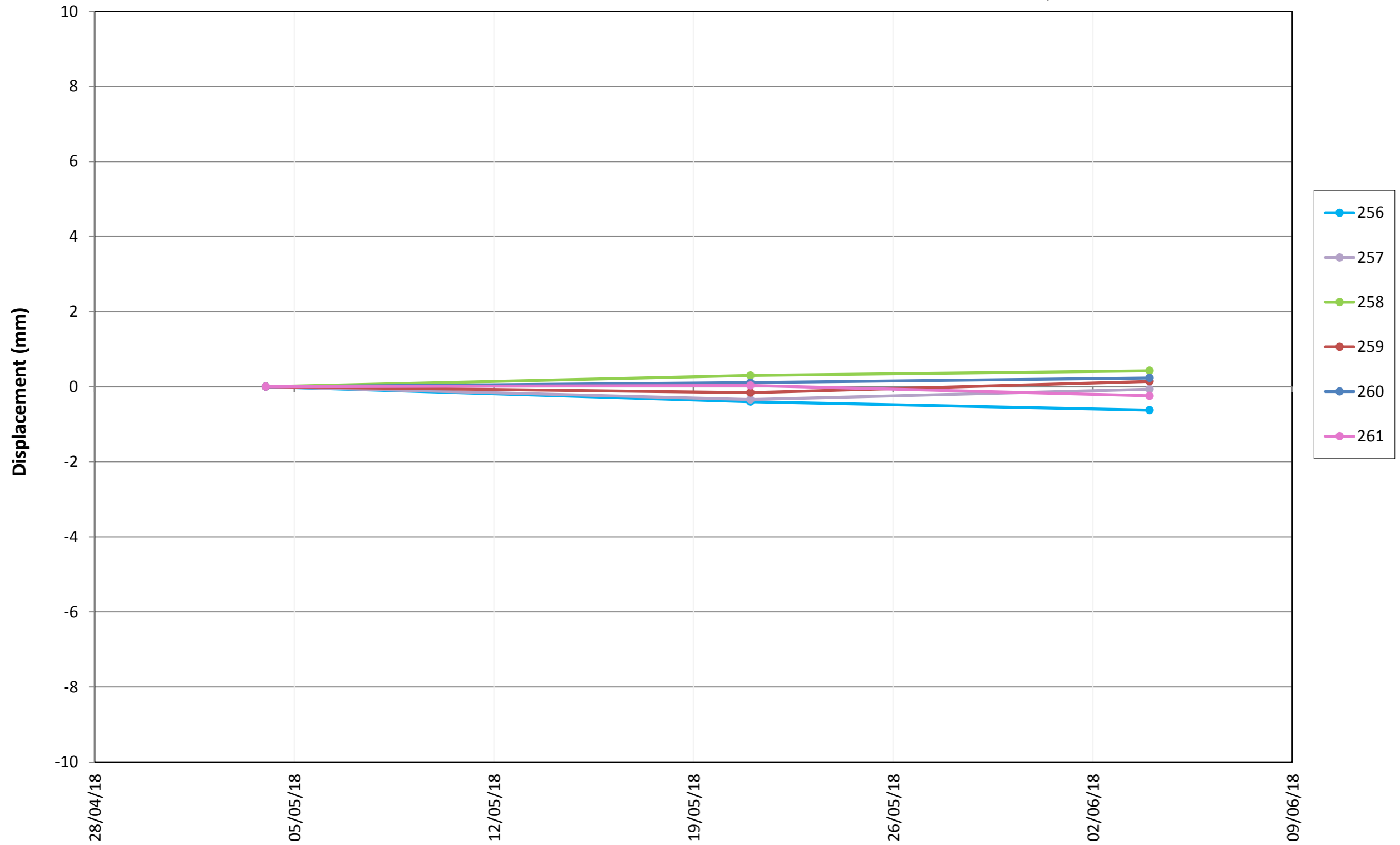


# Vertical Displacement Graph

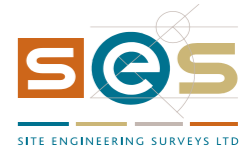


Graph 13V -Targets on Front Elevation of No. 31 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

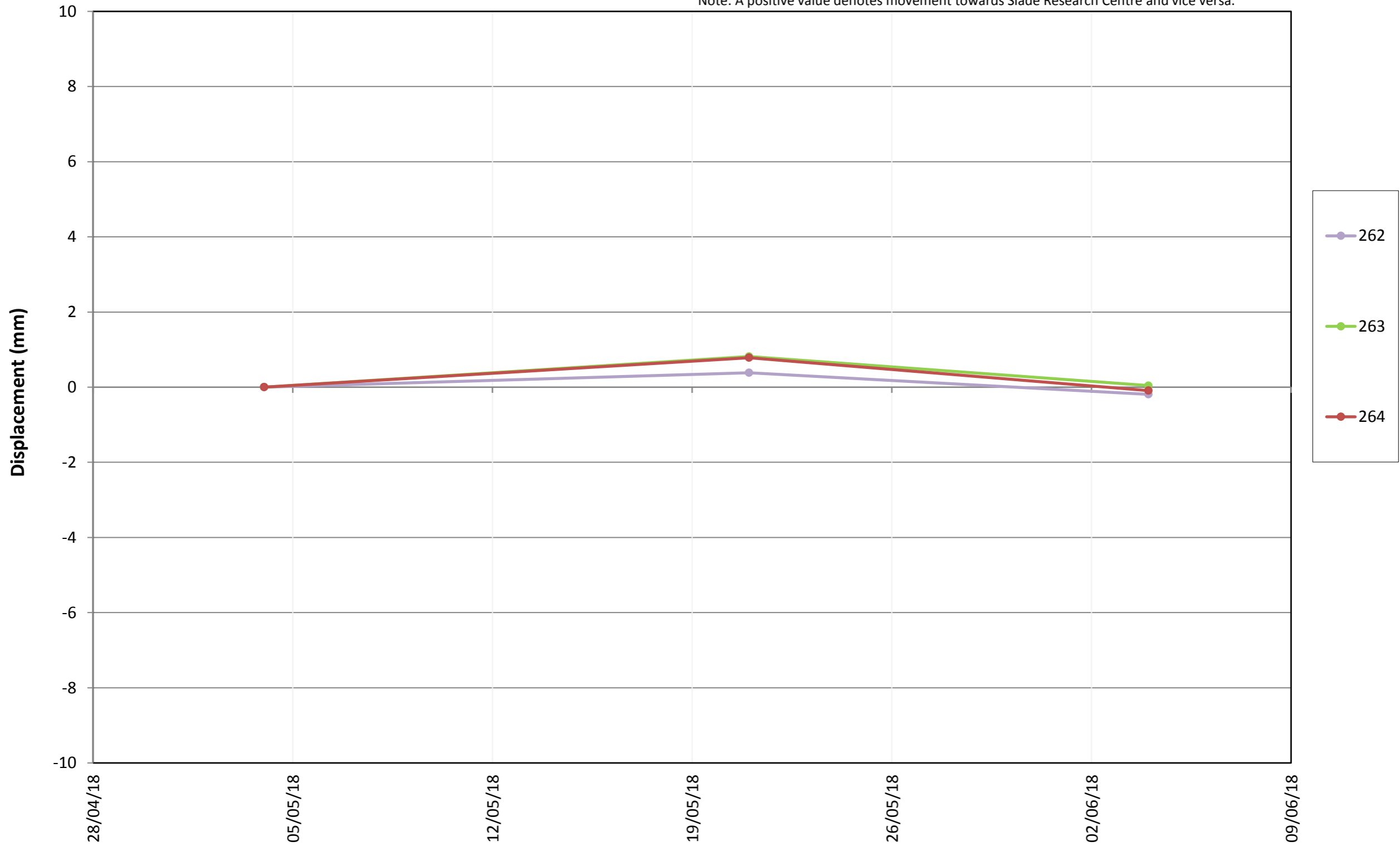


# Transverse Displacement Graph



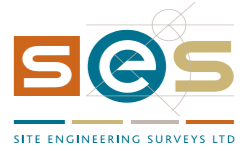
Graph 14T - Targets on Front Elevation of No. 31 Torrington Square

Note: A positive value denotes movement towards Slade Research Centre and vice versa.



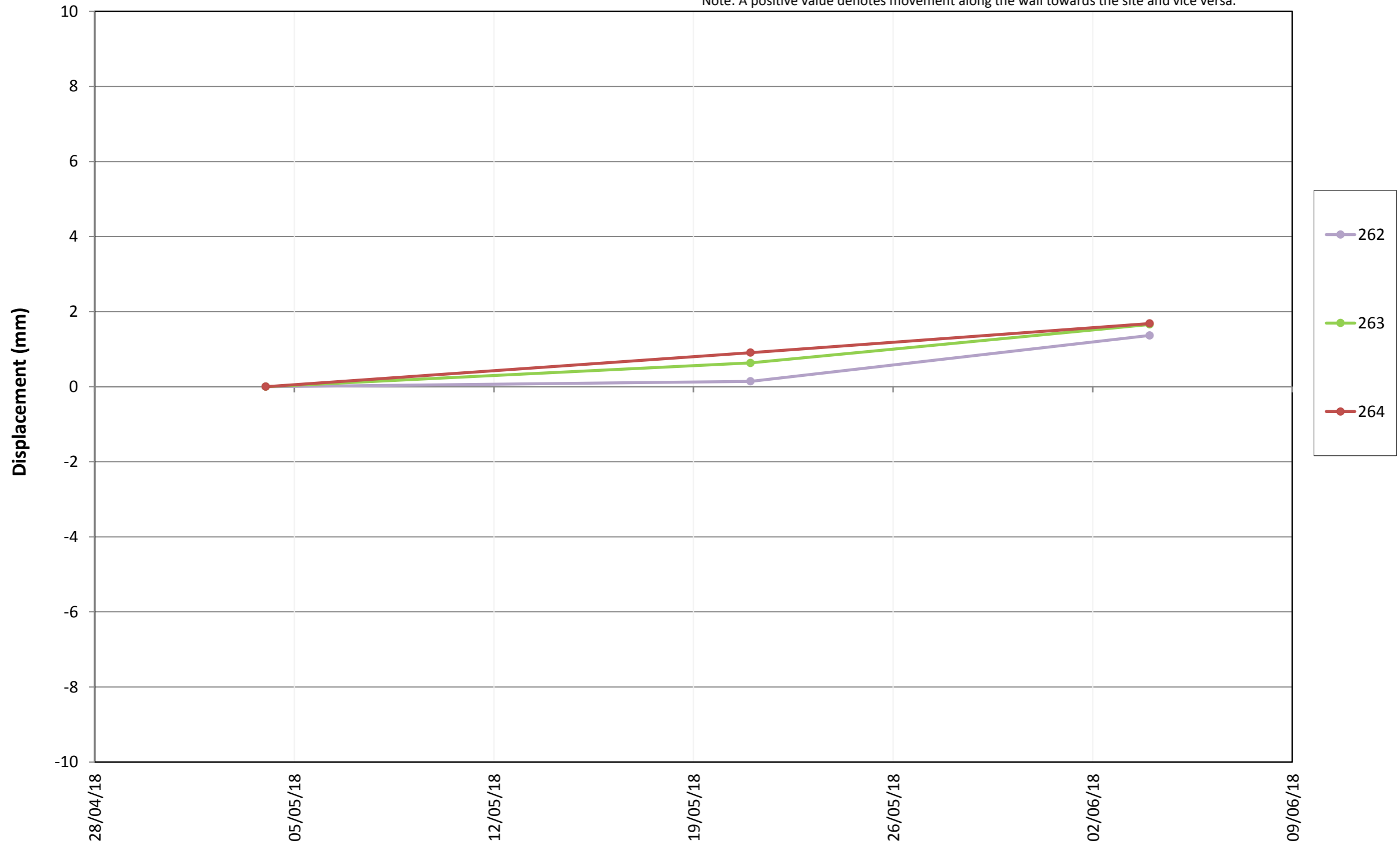


# Longitudinal Displacement Graph

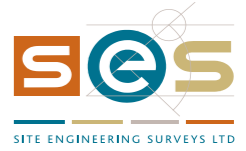


Graph 14L - Targets on Front Elevation of No. 31 Torrington Square

Note: A positive value denotes movement along the wall towards the site and vice versa.

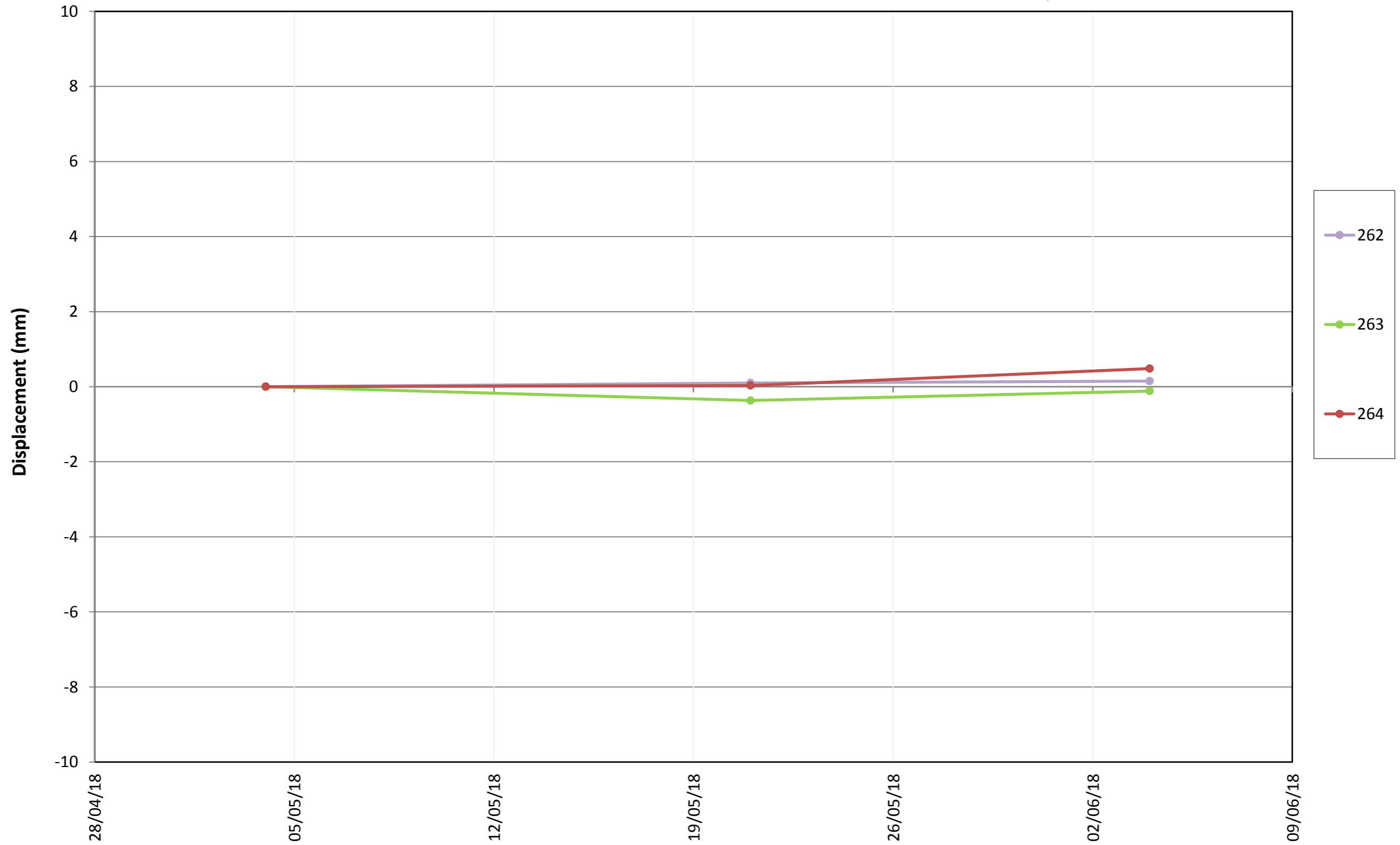


# Vertical Displacement Graph



Graph 14V - Targets on Front Elevation of No. 31 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.



Absolute accuracy of readings: ±2mm

A positive value in the dE column, denotes positive movement in the Eastings coordinate plane and vice versa.

A positive value in the dN column, denotes positive movement in the Northings coordinate plane and vice versa.

A positive value in the dElev column, denotes heave and vice versa

Site Engineering Surveys Ltd.

32-33 Torrington Square

Job no. 10215

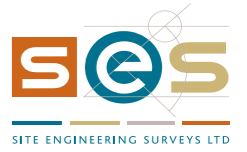


Point	Date of base readings	Average Base readings			Diff to base (mm)			Diff to base (mm)		
					21/05/18			04/06/18		
		Easting	Northing	Level	dE	dN	dElev	dE	dN	dElev

**Targets on Heating Tunnel**

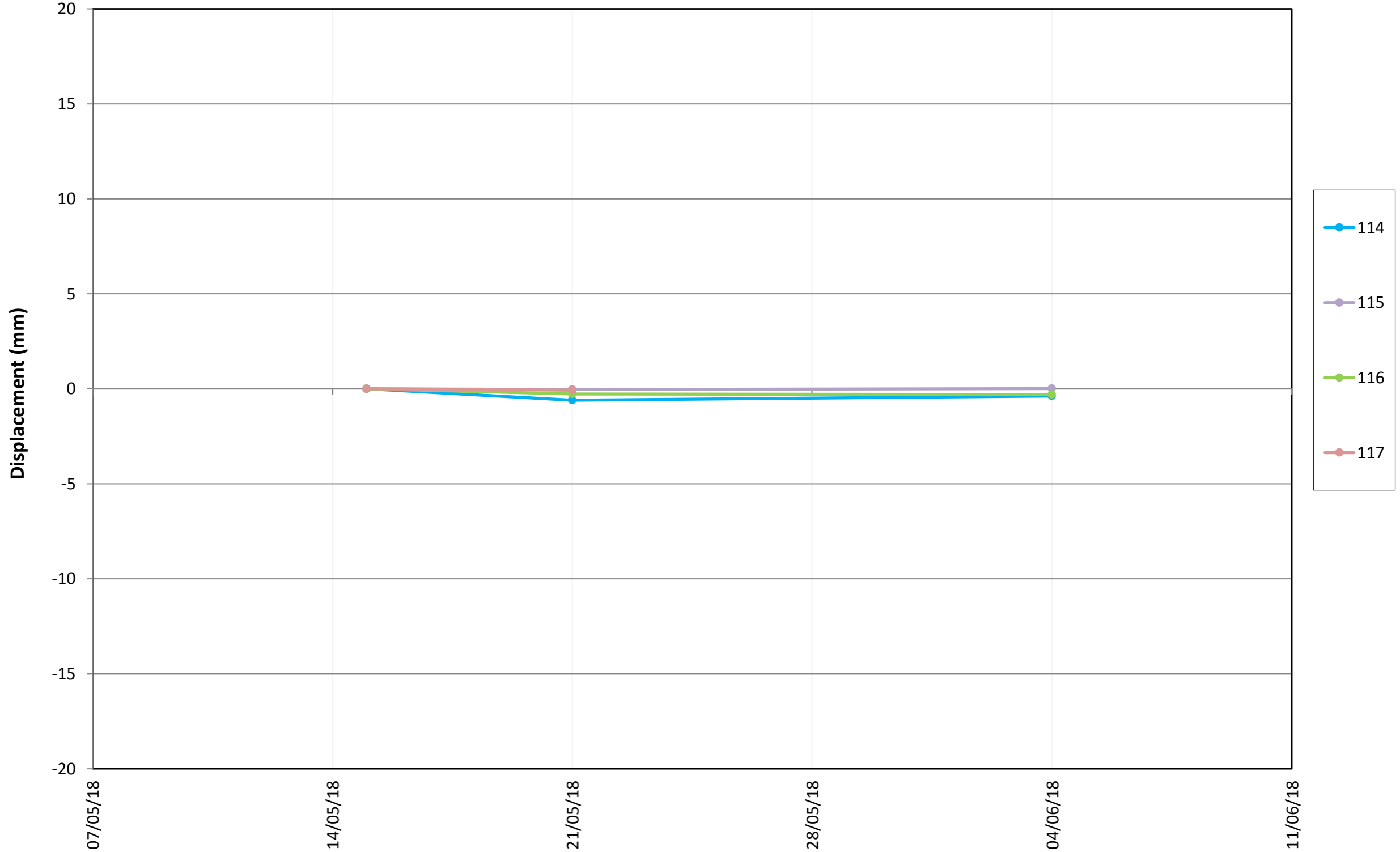
114	15/05/18	511.079	295.654	9.701	0	-1	-1	1	0	0
115	15/05/18	512.070	295.486	8.437	0	0	-1	1	0	0
116	15/05/18	509.279	295.930	9.424	1	0	0	2	0	0
117	15/05/18	508.847	296.036	7.905	0	0	0	1	0	0
118	15/05/18	506.347	296.876	8.966	0	0	0	1	0	0
119	15/05/18	507.339	296.759	6.969	0	0	0	1	0	0
120	15/05/18	503.972	296.967	9.551	1	0	0	1	0	0
121	15/05/18	504.162	297.123	6.820	0	0	0	1	0	0

# Transverse Displacement Graph

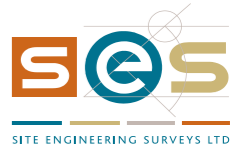


Graph 16T - Targets on Heating Tunnel

Note: A positive value denotes movement towards The Warburg Institute and vice versa.

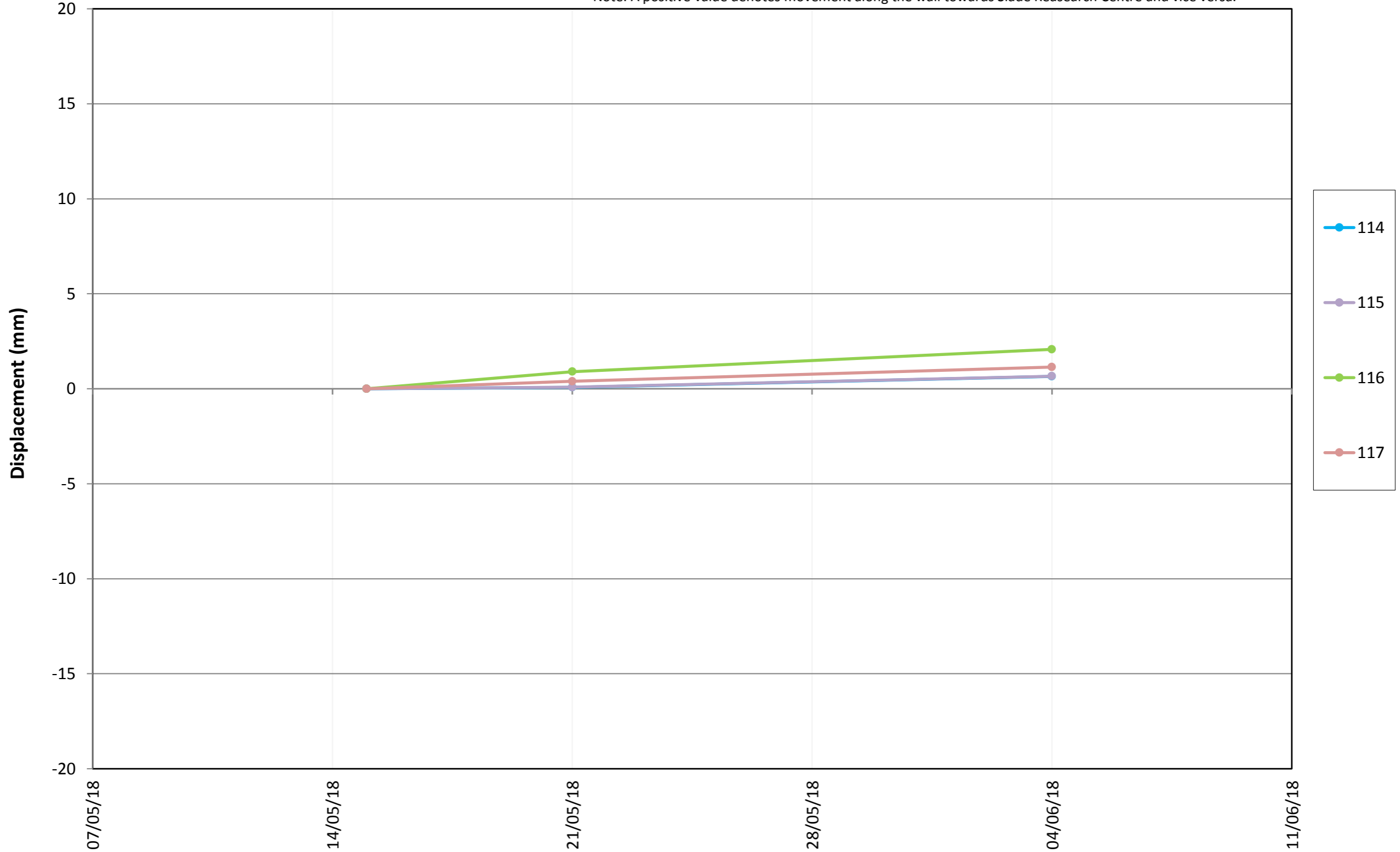


# Longitudinal Displacement Graph

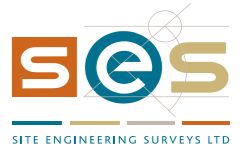


Graph 16L - Targets on Heating Tunnel

Note: A positive value denotes movement along the wall towards Slade Research Centre and vice versa.

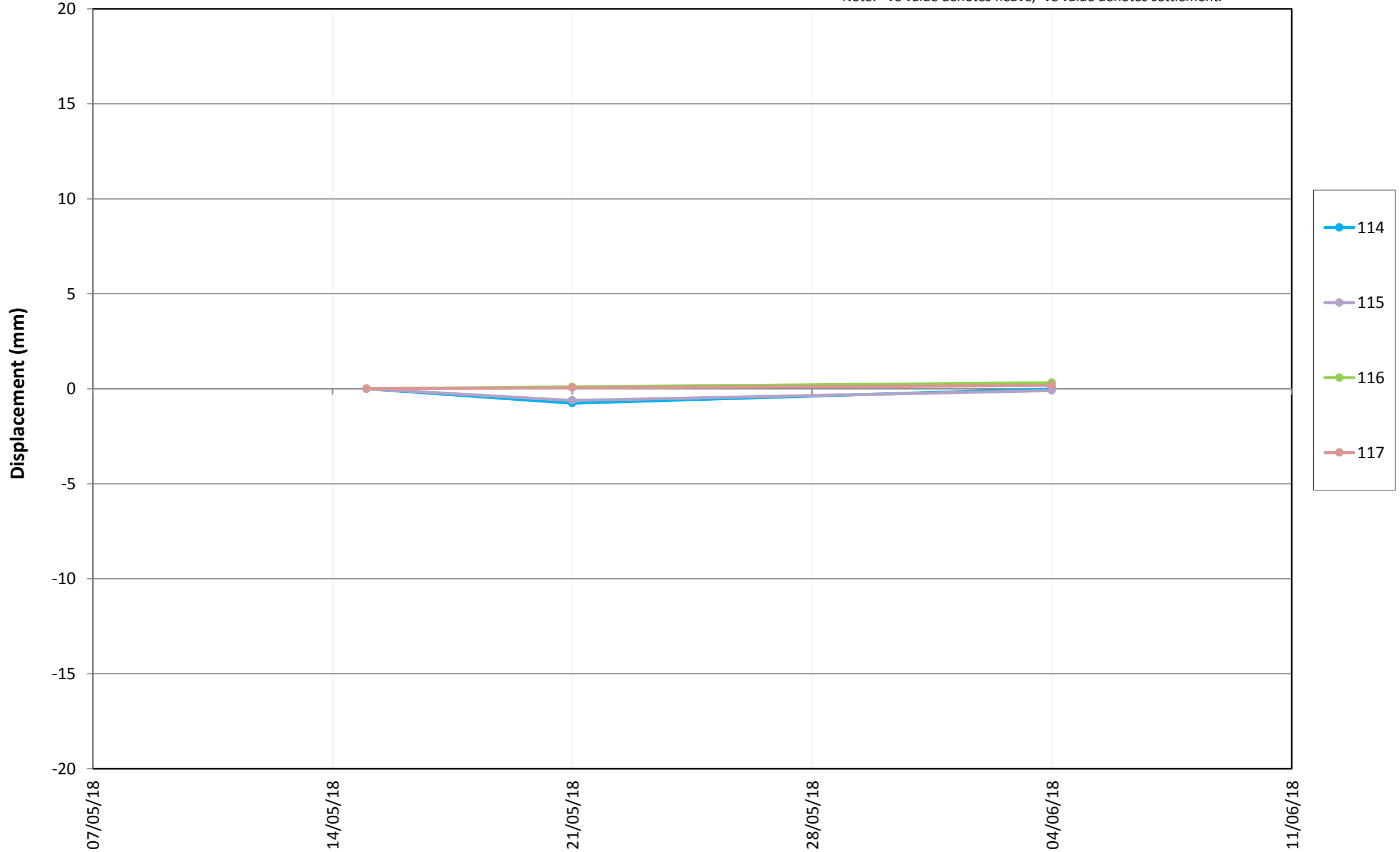


# Vertical Displacement Graph

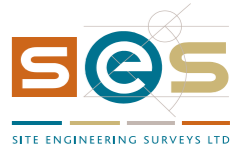


Graph 16V - Targets on Heating Tunnel

Note: +ve value denotes heave, -ve value denotes settlement.

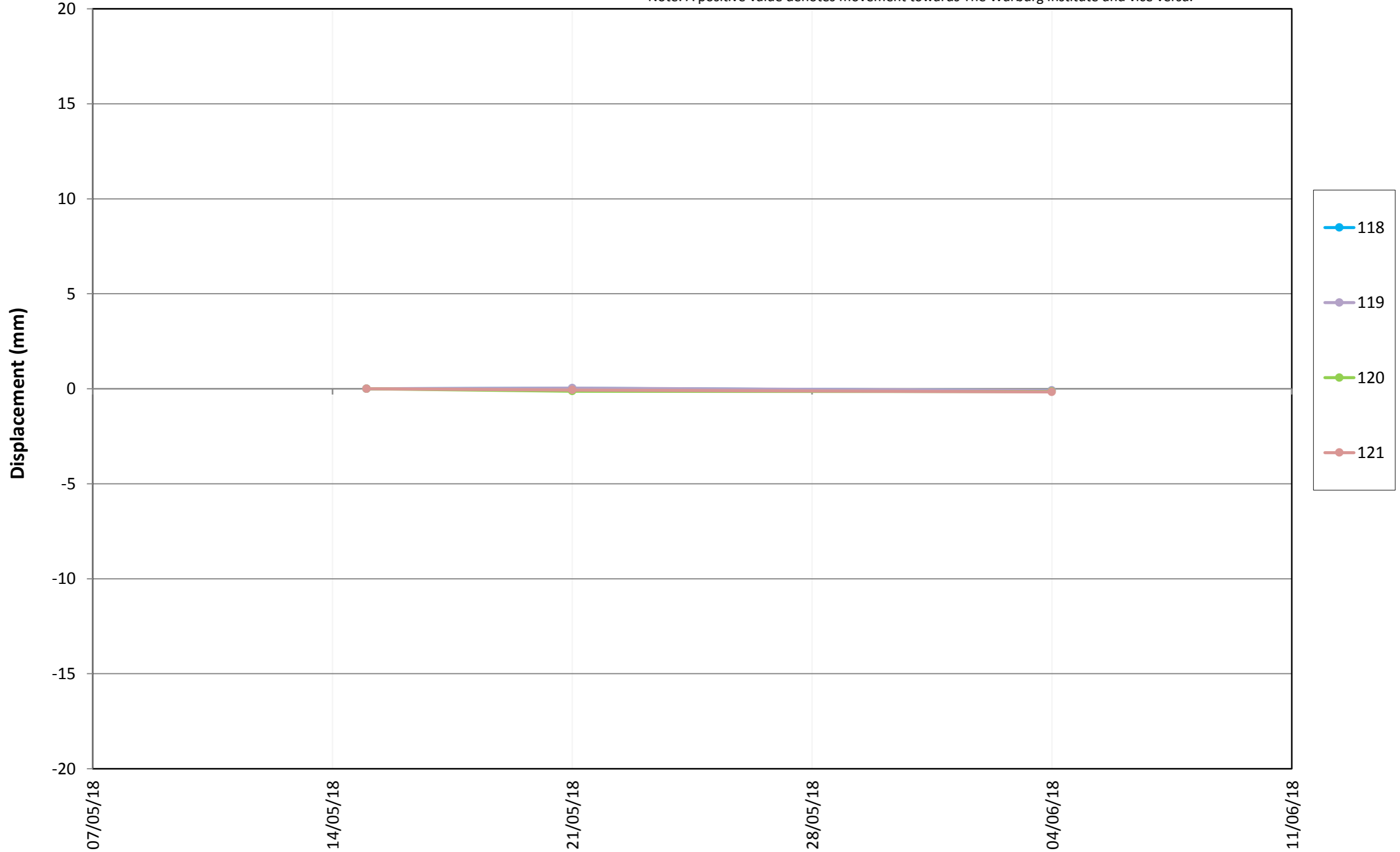


# Transverse Displacement Graph

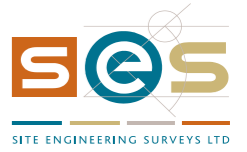


Graph 17T - Targets on Heating Tunnel

Note: A positive value denotes movement towards The Warburg Institute and vice versa.

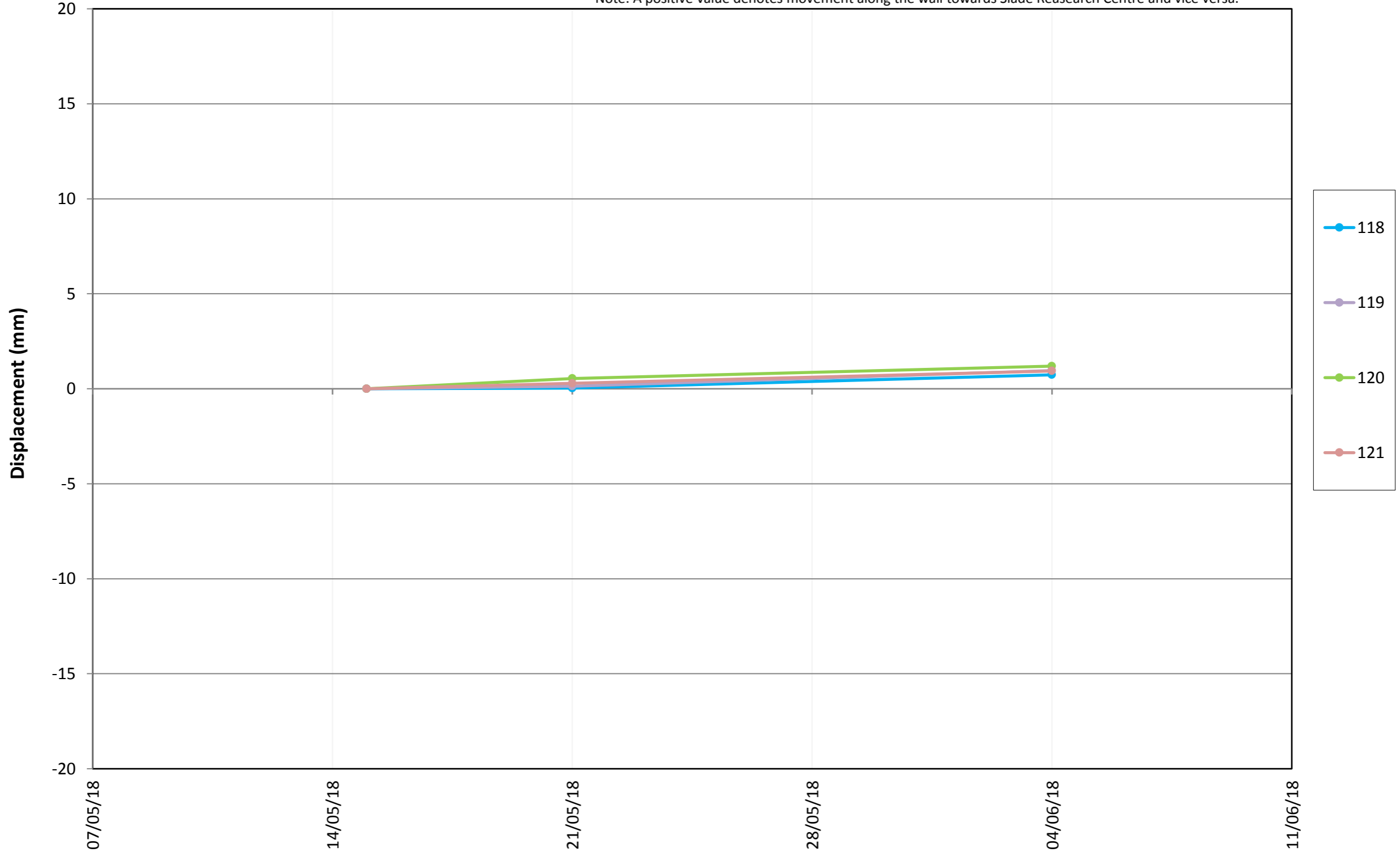


# Longitudinal Displacement Graph



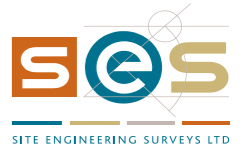
Graph 17L - Targets on Heating Tunnel

Note: A positive value denotes movement along the wall towards Slade Research Centre and vice versa.



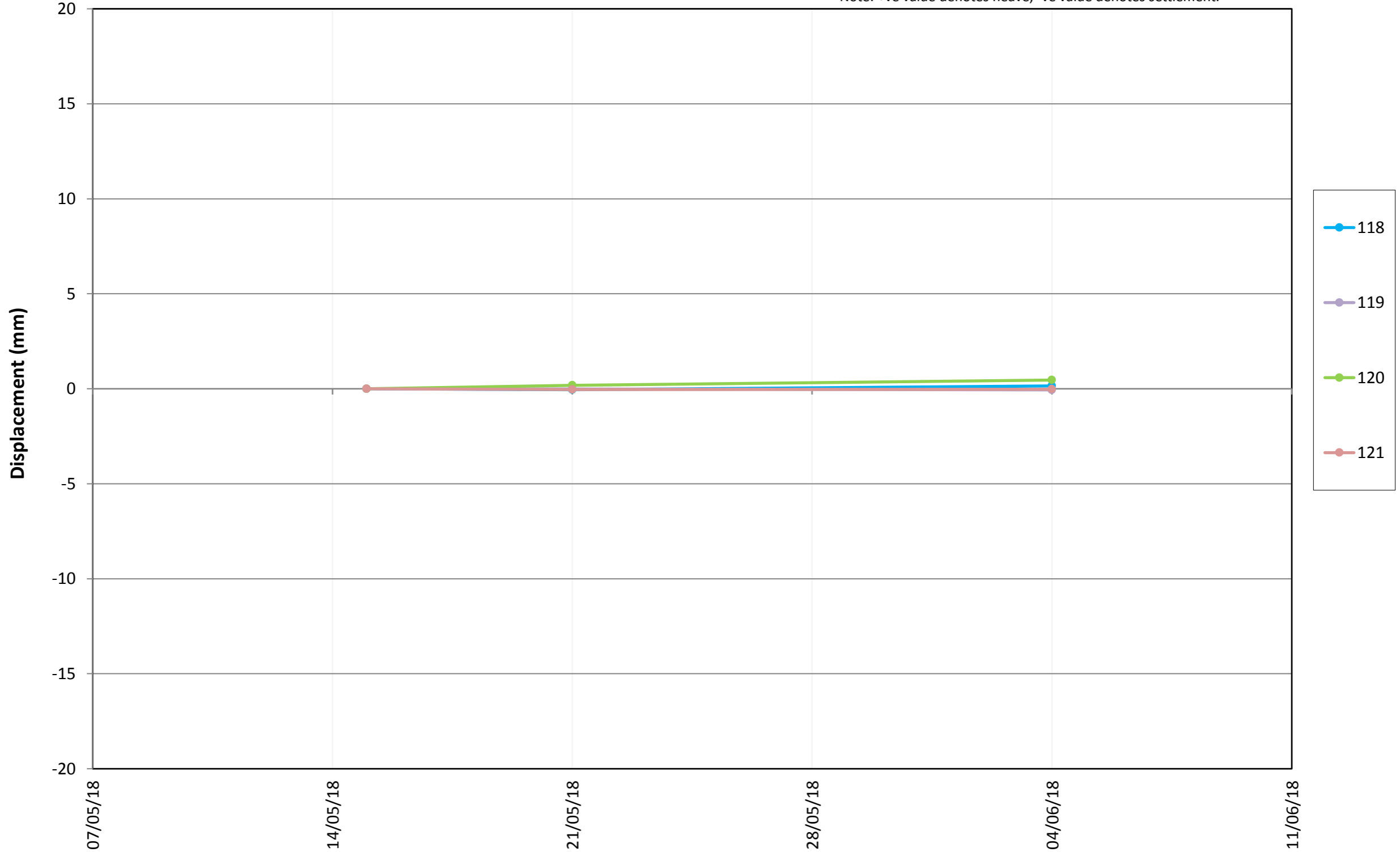


# Vertical Displacement Graph



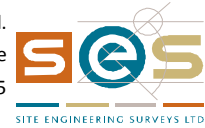
Graph 17V - Targets on Heating Tunnel

Note: +ve value denotes heave, -ve value denotes settlement.



Notes: A positive difference denotes heave and vice versa

Site Engineering Surveys Ltd.  
32-33 Torrington Square  
Job no. 10215



## Precise Levels

Point	Type	Date of base readings	Average	Level	Diff (mm)	Level	Diff (mm)
				21/05/18		04/06/18	

### Precise Level Points along Torrington Square

101	Stud	10/05/18	10.1537	10.1541	0.4	10.1541	0.3
102	Stud	10/05/18	10.1406	10.1411	0.5	10.1413	0.6
103	Stud	10/05/18	10.2904	10.2906	0.2	10.2908	0.4
104	Stud	10/05/18	10.3225	10.3227	0.2	10.3227	0.2
105	Stud	10/05/18	10.3768	10.3770	0.2	10.3772	0.4
106	Stud	10/05/18	10.3685	10.3684	-0.1	10.3683	-0.2
107	Stud	10/05/18	10.4464	10.4465	0.1	10.4468	0.4
108	Stud	10/05/18	10.4890	10.4888	-0.2	10.4890	0.0

### Precise Level Points along courtyard

109	Stud	10/05/18	7.3923	7.3924	0.1	7.3924	0.2
110	Stud	10/05/18	7.4089	7.4092	0.2	7.4092	0.2
111	Stud	10/05/18	7.3493	7.3499	0.5	Disturbed	
112	Stud	10/05/18	7.3331	7.3336	0.5	7.3332	0.1
113	Stud	10/05/18	7.3241	7.3246	0.5	7.3246	0.5

### Precise Level Points on Front Elevation of The Warburg Institute

301	Barcode	17/05/18	11.3331	11.3333	0.2	11.3333	0.2
302	Barcode	17/05/18	11.5600	11.5600	0.0	11.5598	-0.2

### Precise Level Points on Side Elevation of The Warburg Institute

303	Barcode	17/05/18	10.5505	10.5502	-0.3	10.5503	-0.2
-----	---------	----------	---------	---------	------	---------	------

### Precise Level Points on Rear Elevation of The Warburg Institute

304	Barcode	10/05/18	7.5766	7.5768	0.2	7.5766	0.0
305	Barcode	10/05/18	7.4026	7.4028	0.2	7.4029	0.3

### Precise Level Points on Side Elevation of No. 32 Torrington Square

306	Barcode	10/05/18	11.6650	11.6648	-0.2	11.6650	0.0
307	Barcode	10/05/18	11.6995	11.6995	0.0	11.6995	0.0

### Precise Level Points on Front Elevation of No. 32 Torrington Square

308	Barcode	17/05/18	11.7717	11.7717	0.0	11.7717	0.0
309	Barcode	17/05/18	11.3719	11.3714	-0.4	11.3719	0.0

Notes: A positive difference denotes heave and vice versa

## Precise Levels

Point	Type	Date of base readings	Average	Level	Diff (mm)	Level	Diff (mm)
				21/05/18		04/06/18	

### Precise Level Points on Front Elevation of No. 31 Torrington Square

310	Barcode	10/05/18	11.2639	11.2639	0.1	11.2643	0.4
311	Barcode	10/05/18	11.5500	11.5502	0.2	11.5504	0.4
312	Barcode	10/05/18	11.3591	11.3595	0.3	11.3595	0.4

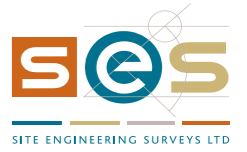
### Precise Level Points on Staircase

313	Barcode	17/05/18	8.4376	8.4374	-0.1	8.4373	-0.3
314	Barcode	17/05/18	8.4817	8.4817	-0.1	8.4816	-0.2
315	Barcode	17/05/18	8.5875	8.5873	-0.2	8.5872	-0.3
316	Barcode	17/05/18	8.5552	8.5552	0.0	8.5549	-0.2

### Benchmarks

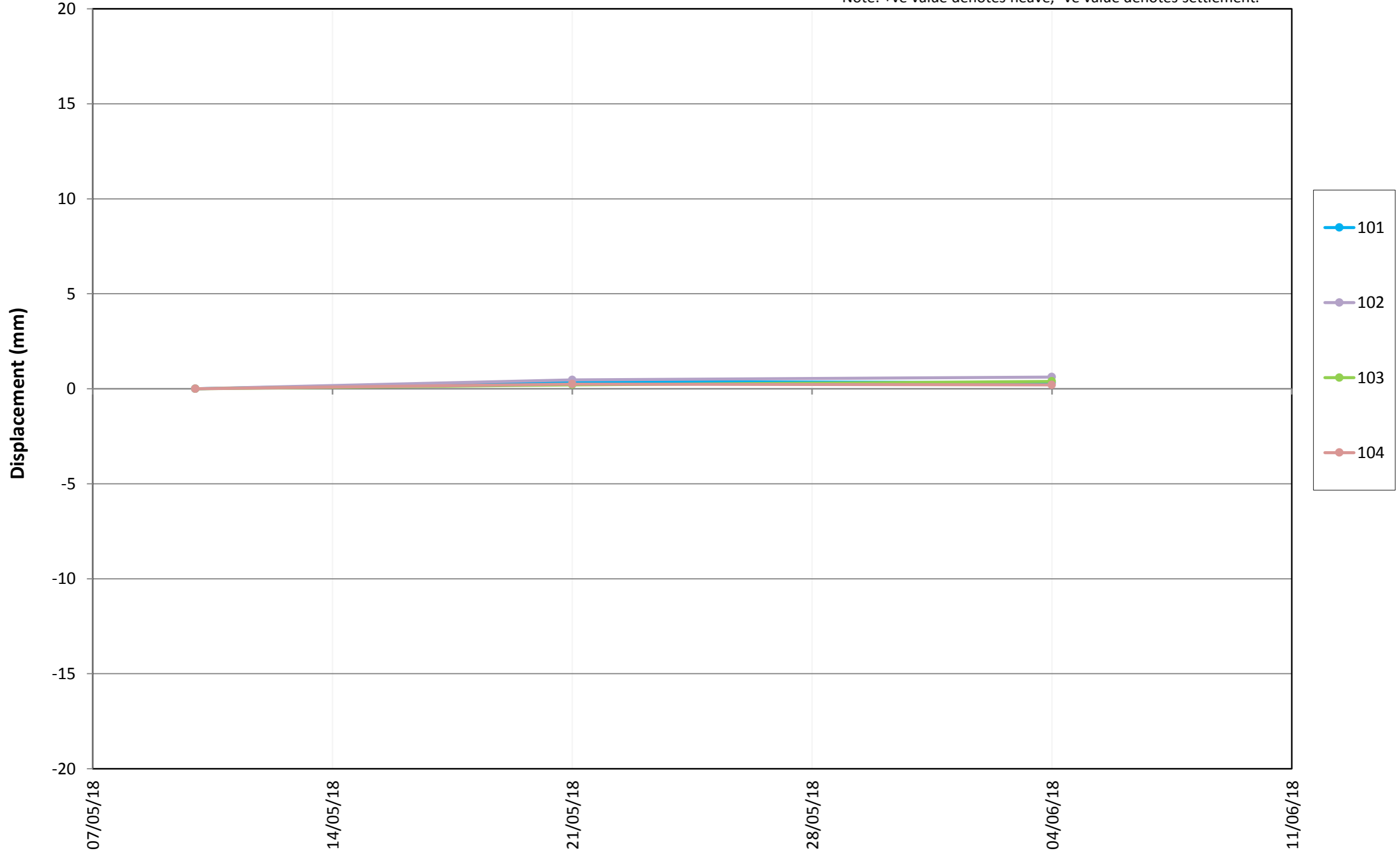
1001	Stud	10/05/18	9.7800	9.7800	0.0	9.7800	0.0
1002	Stud	10/05/18	9.4801	9.4802	0.1	9.4801	0.0
1003	Stud	10/05/18	9.8229	9.8231	0.2	9.8231	0.2
1004	Stud	10/05/18	7.6630	7.6630	0.0	7.6630	0.0
1005	Stud	10/05/18	7.7993	7.7996	0.2	7.7996	0.2

# Vertical Displacement Graph

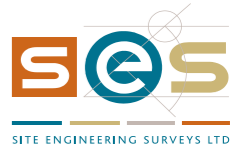


Graph 01 - Precise Level Points along Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

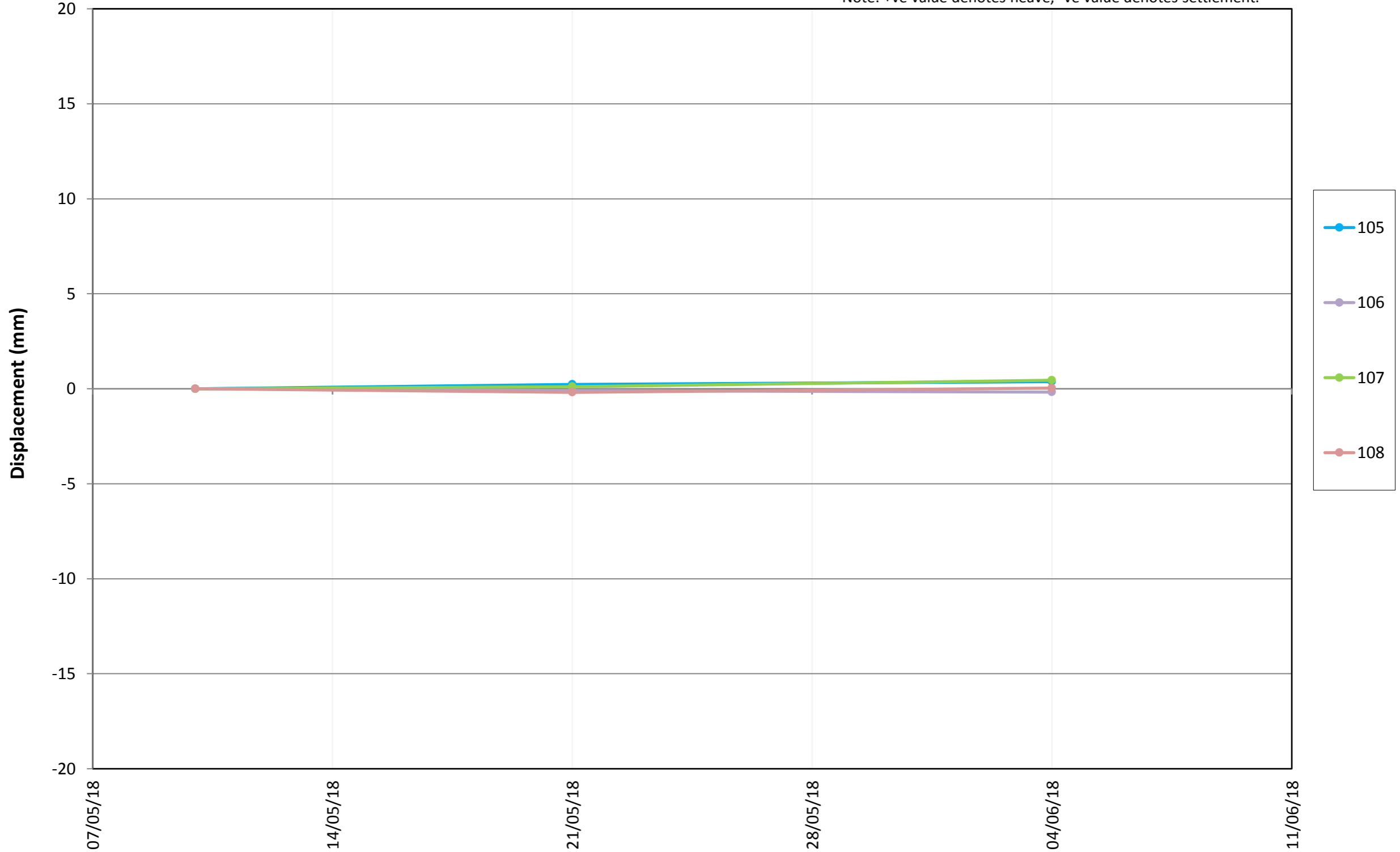


# Vertical Displacement Graph

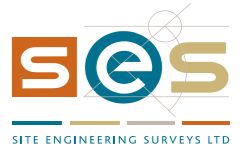


Graph 02 - Precise Level Points along Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

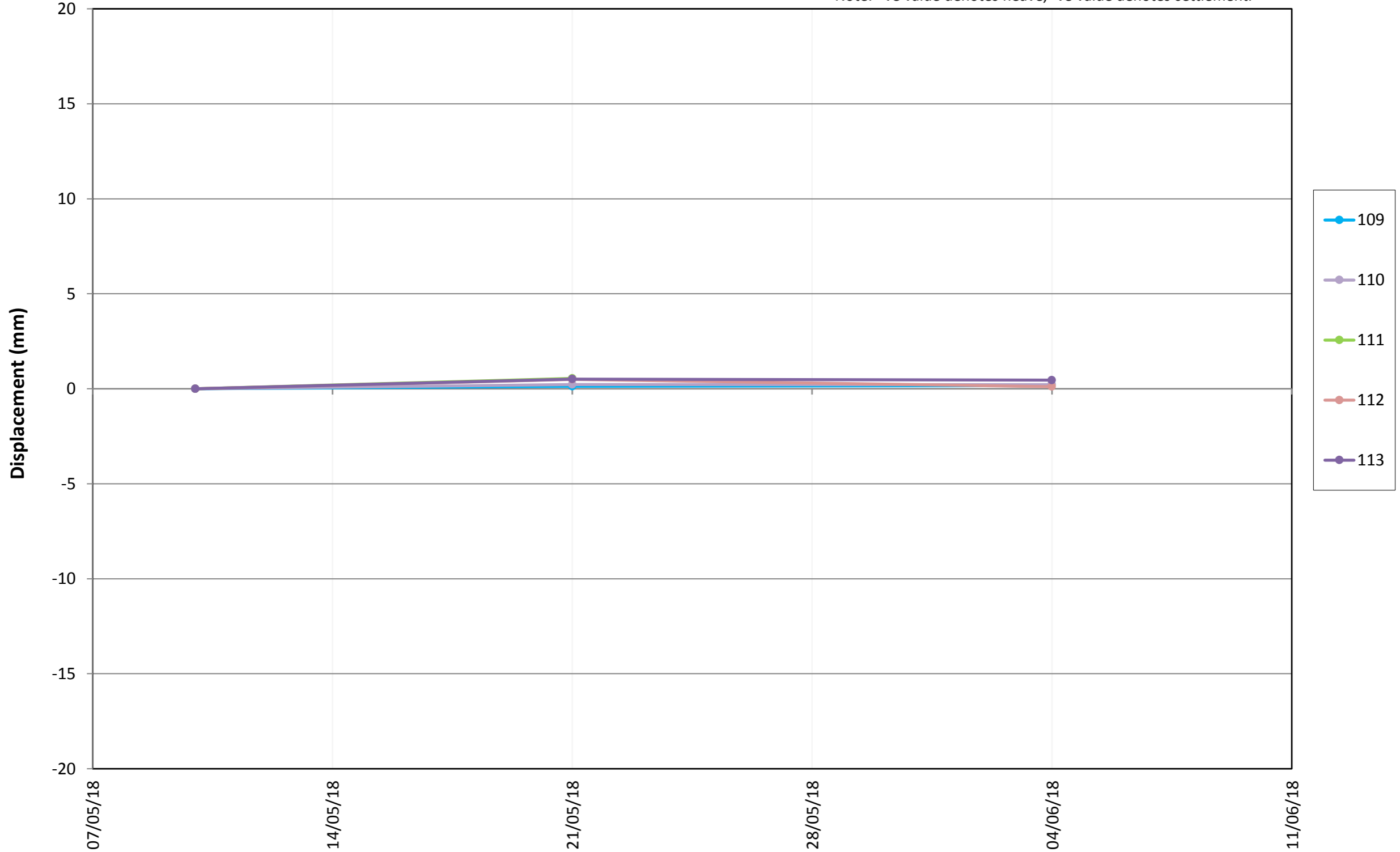


# Vertical Displacement Graph

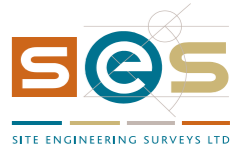


Graph 03 - Precise Level Points along courtyard

Note: +ve value denotes heave, -ve value denotes settlement.

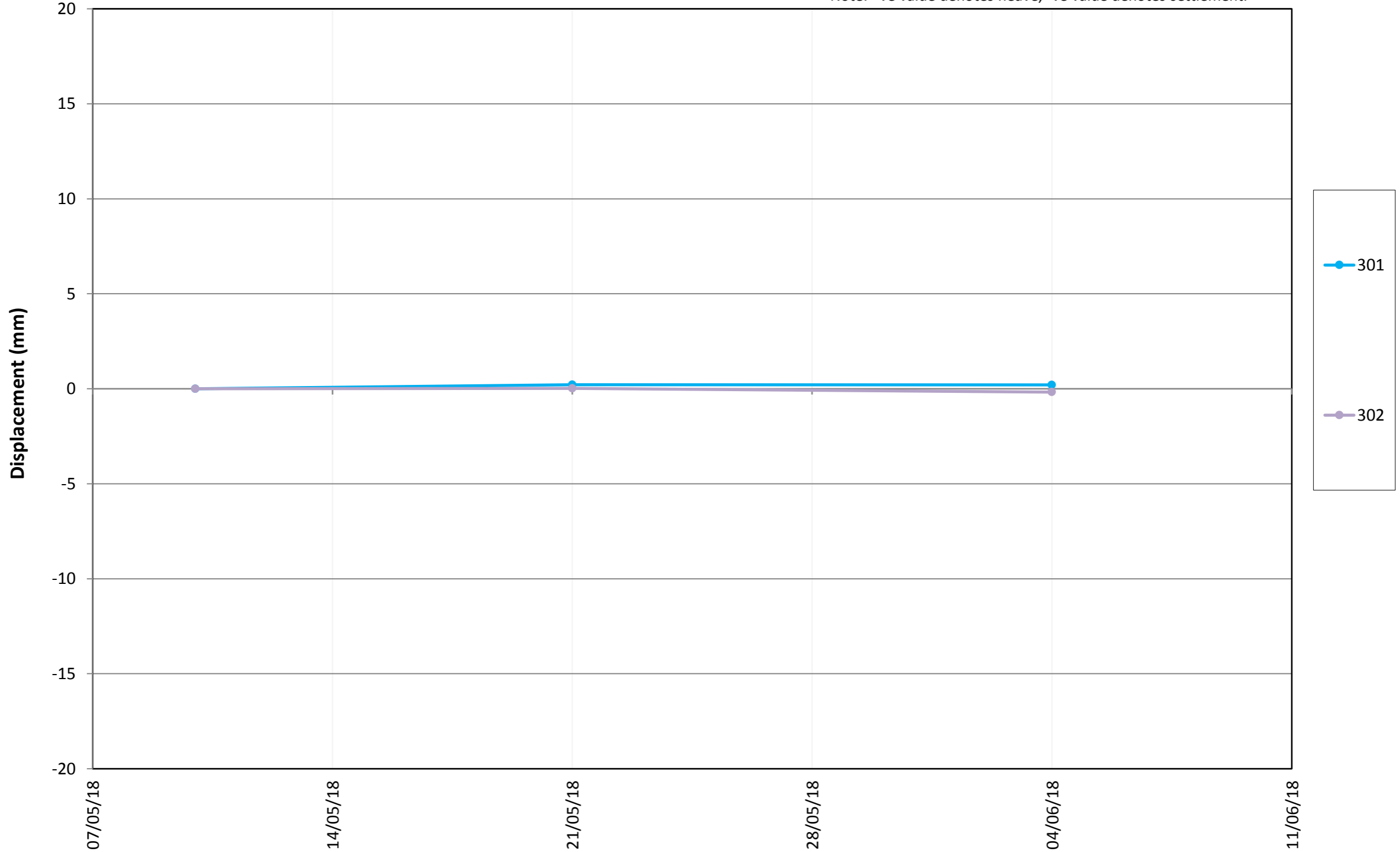


# Vertical Displacement Graph

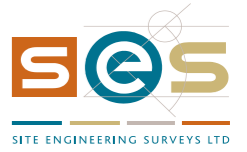


Graph 04 - Precise Level Points on Front Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.

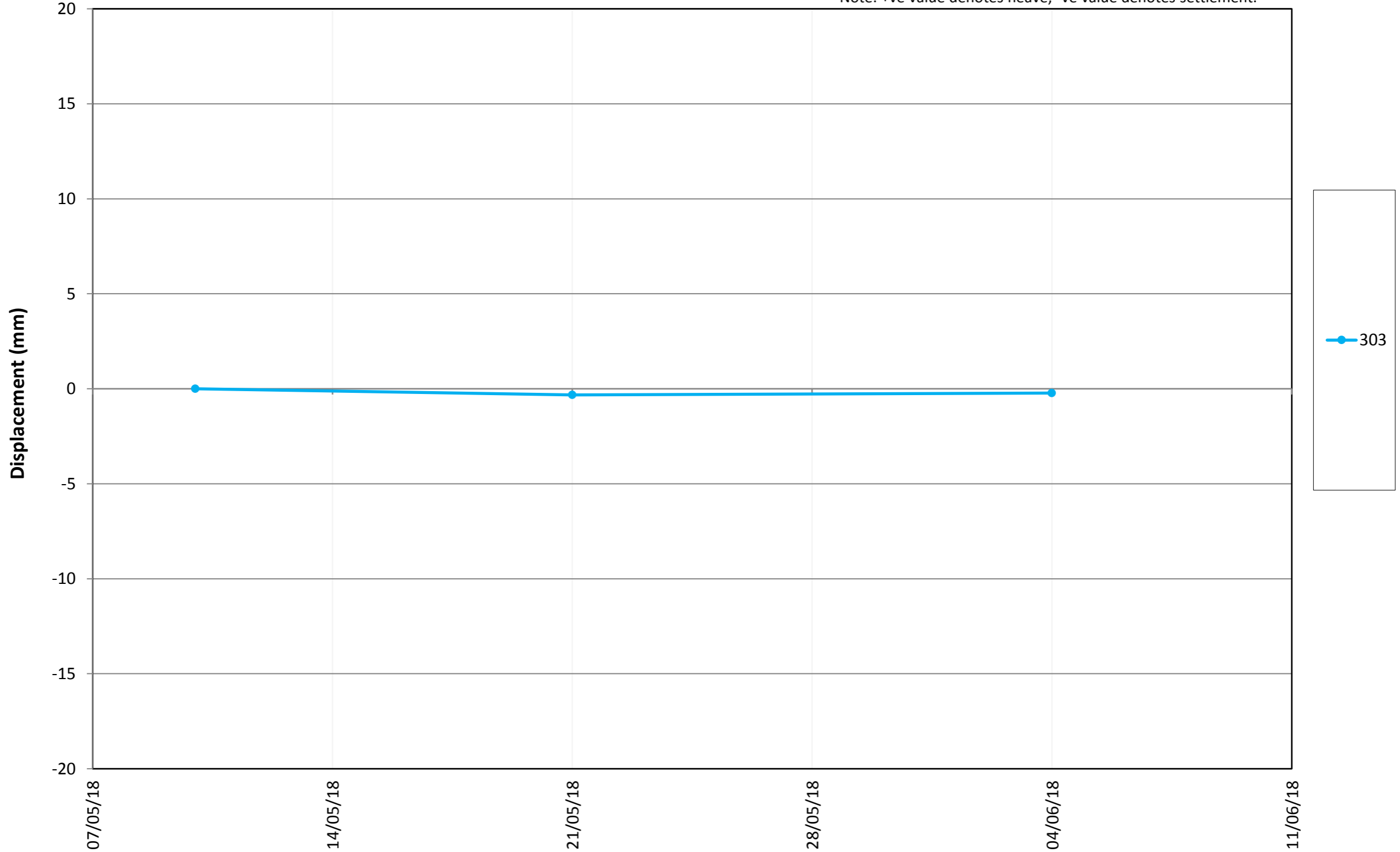


# Vertical Displacement Graph



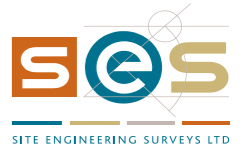
Graph 05 - Precise Level Points on Side Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.



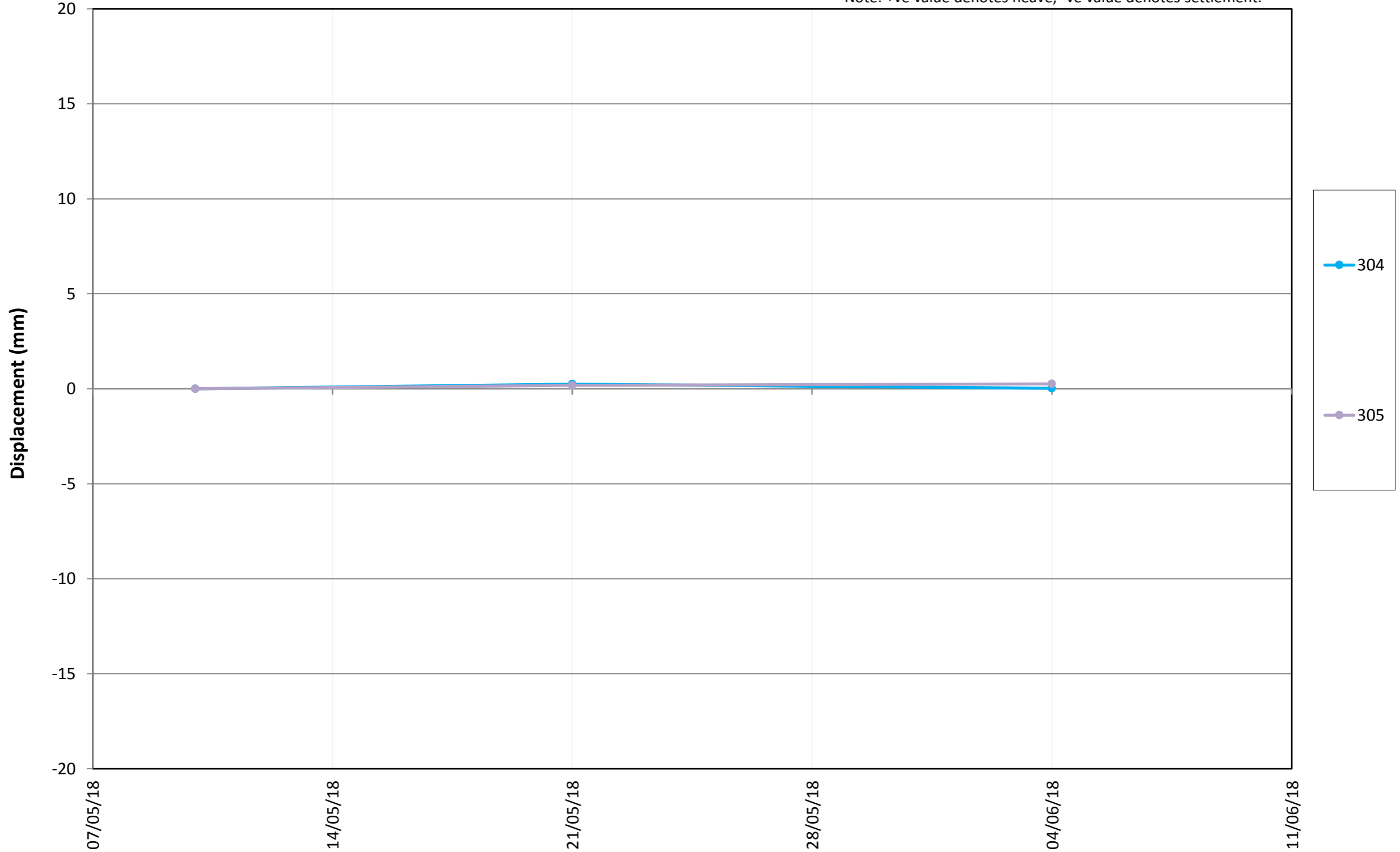


# Vertical Displacement Graph

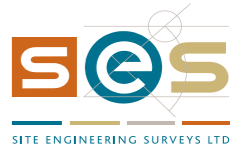


Graph 06 - Precise Level Points on Rear Elevation of The Warburg Institute

Note: +ve value denotes heave, -ve value denotes settlement.

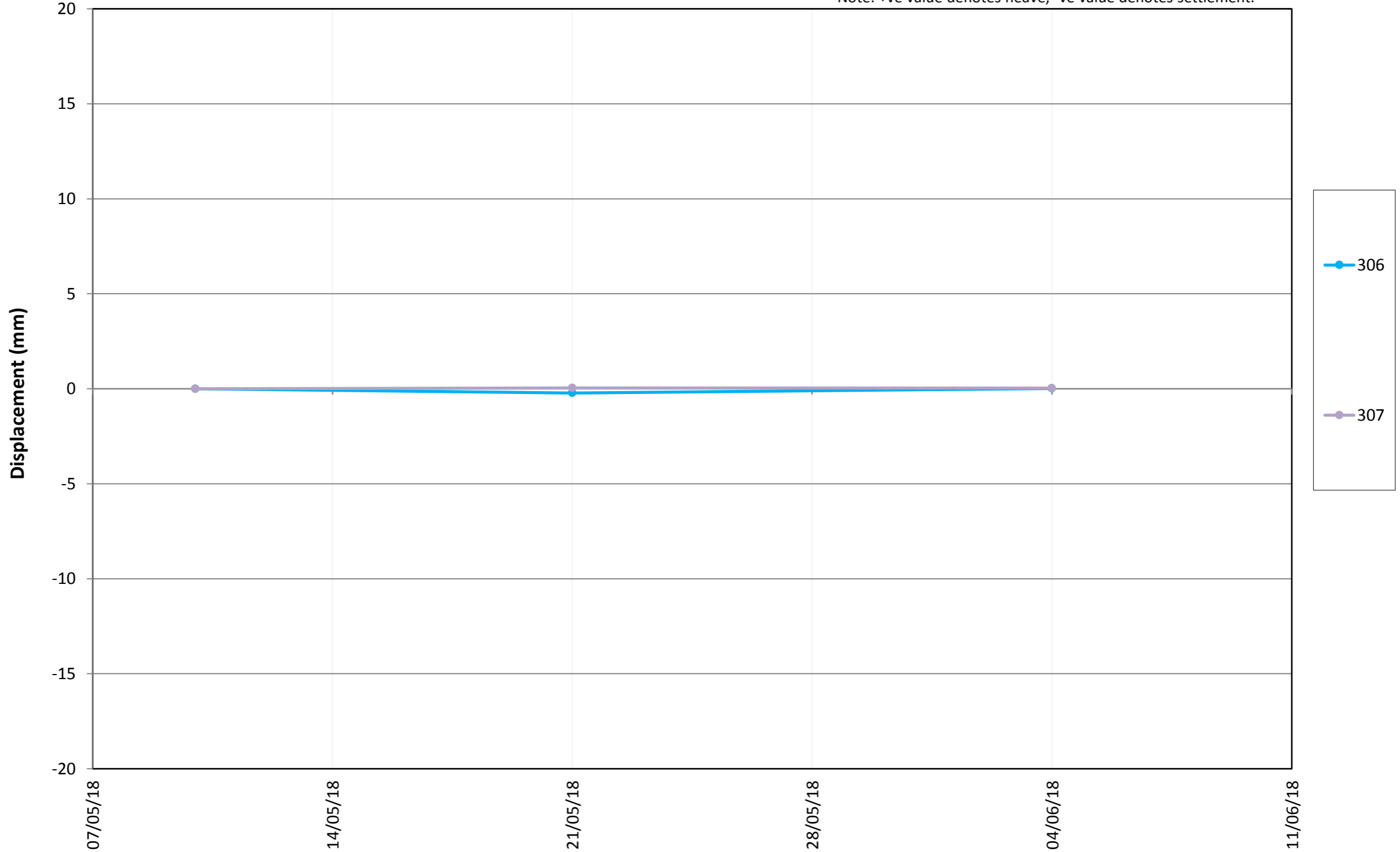


# Vertical Displacement Graph

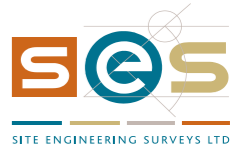


Graph 07 - Precise Level Points on Side Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

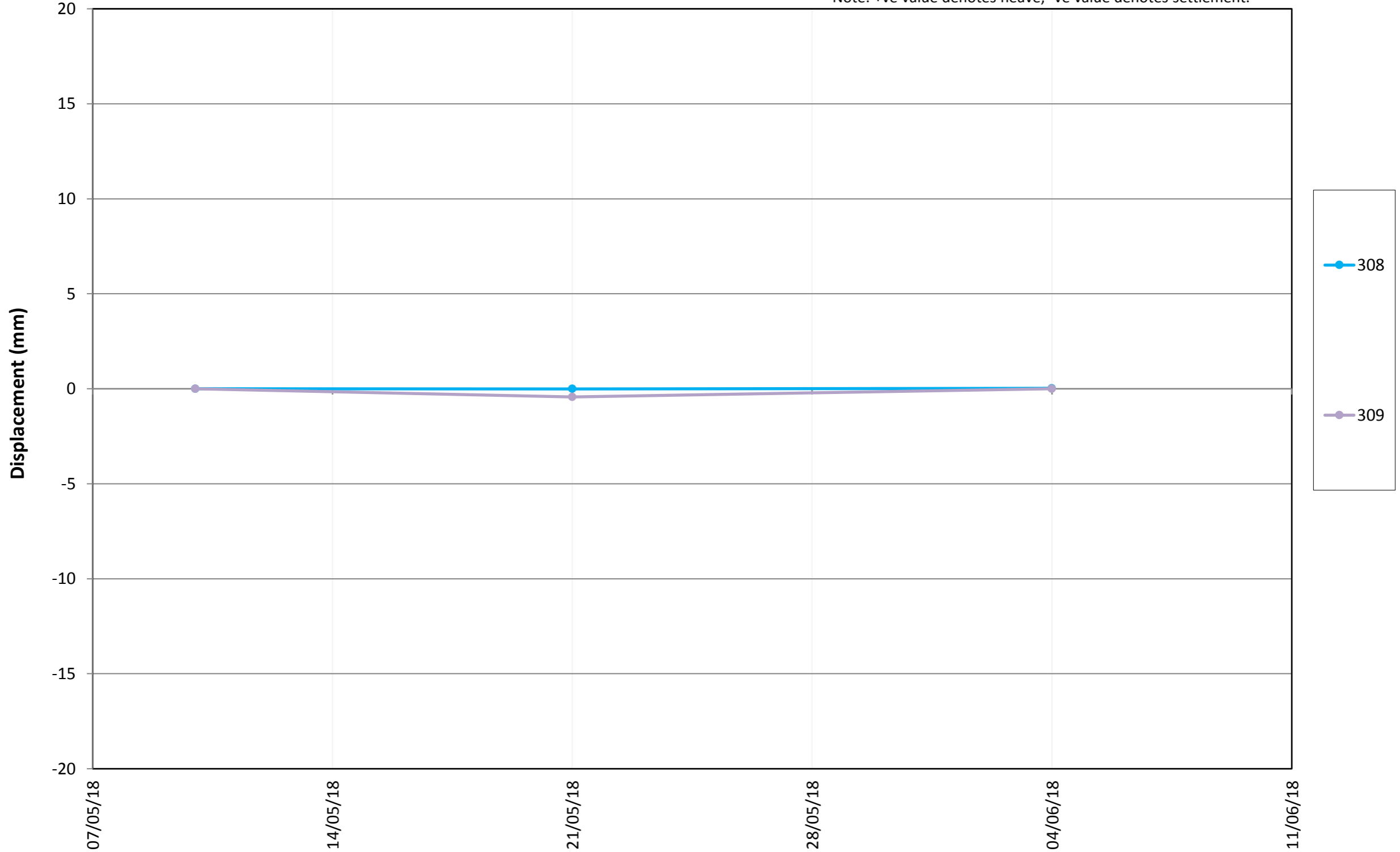


# Vertical Displacement Graph

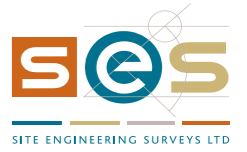


Graph 08 - Precise Level Points on Front Elevation of No. 32 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

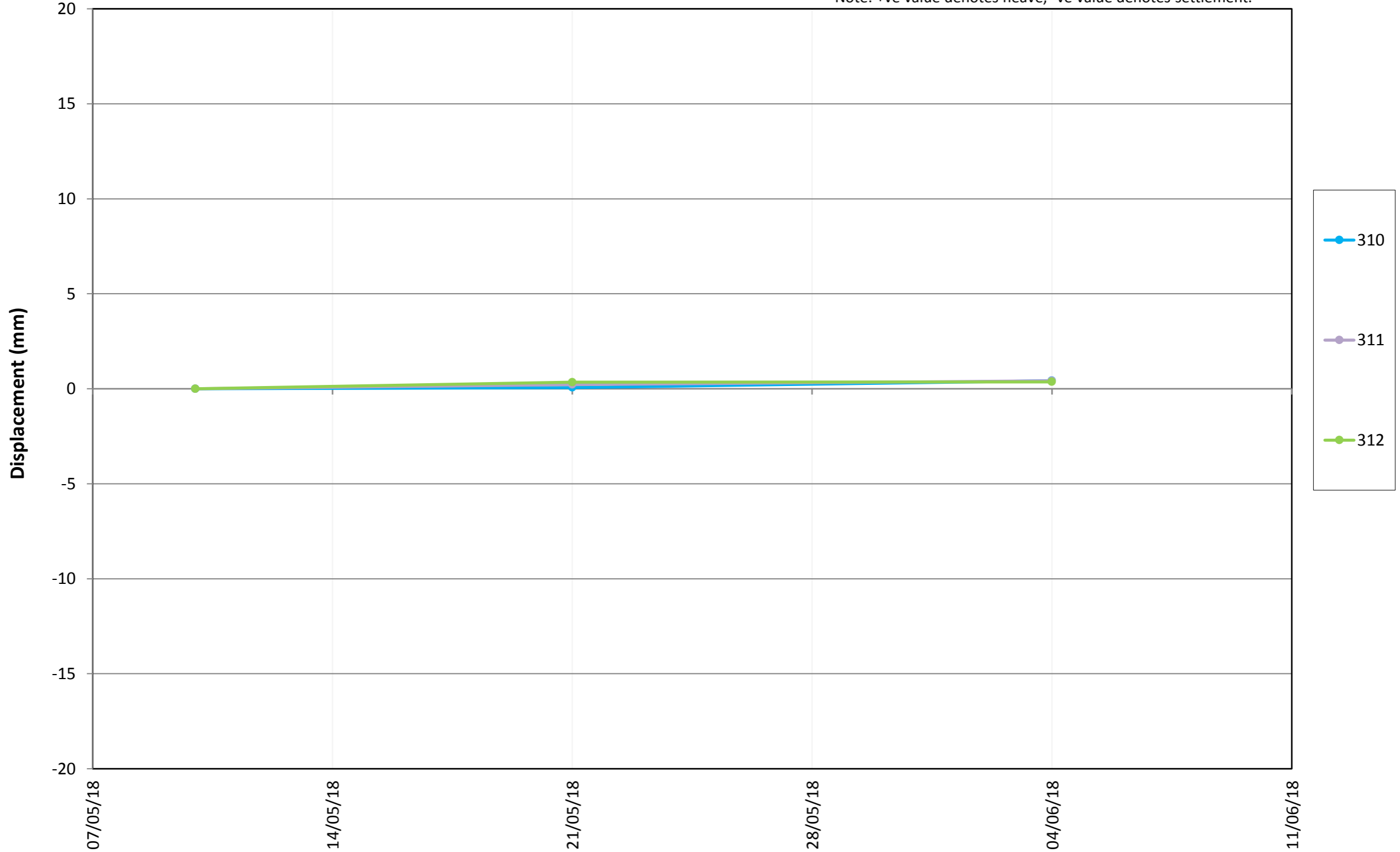


# Vertical Displacement Graph

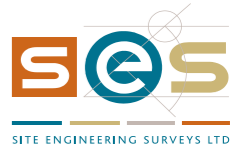


Graph 09 - Precise Level Points on Front Elevation of No. 31 Torrington Square

Note: +ve value denotes heave, -ve value denotes settlement.

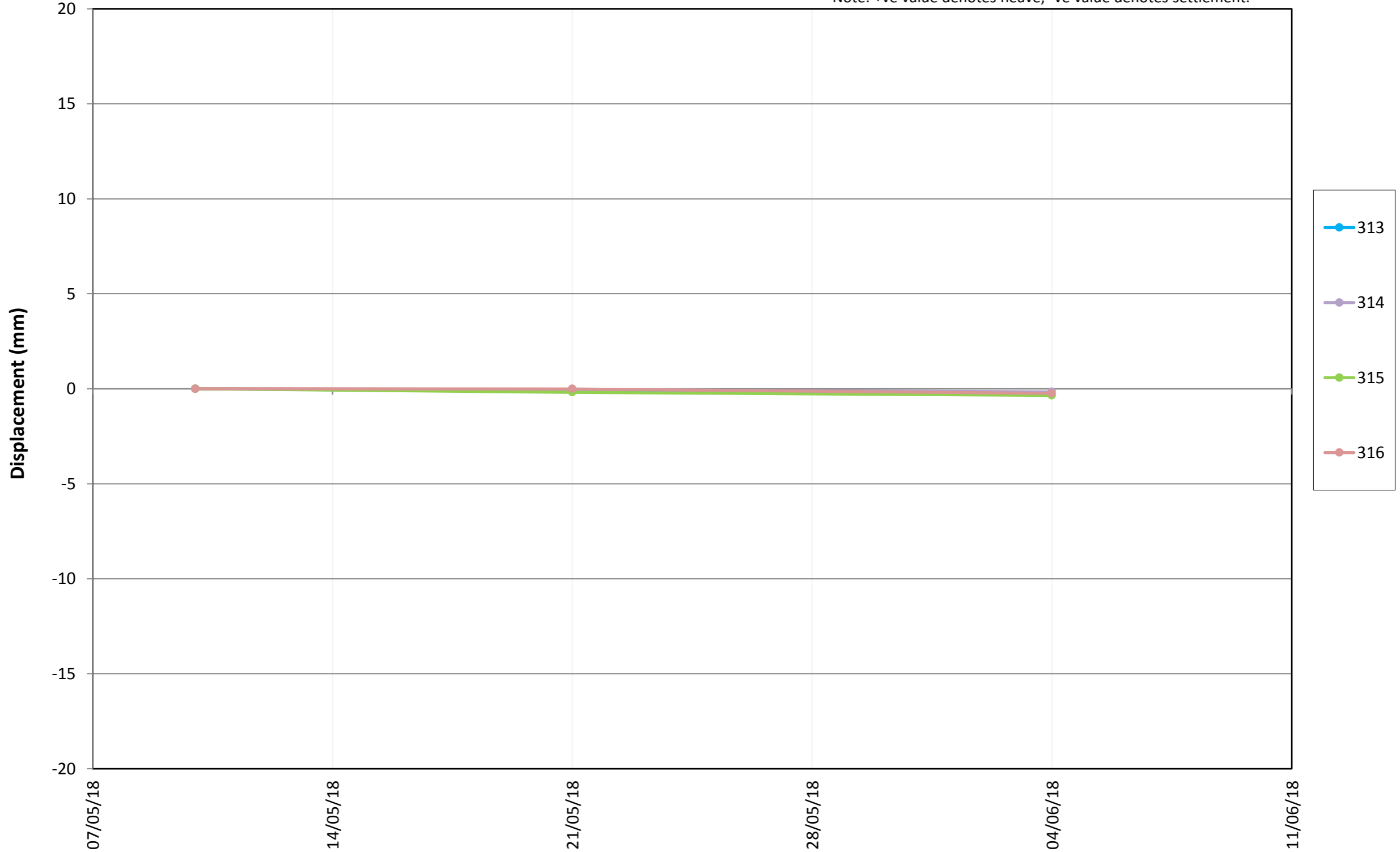


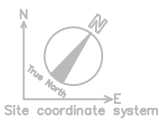
# Vertical Displacement Graph



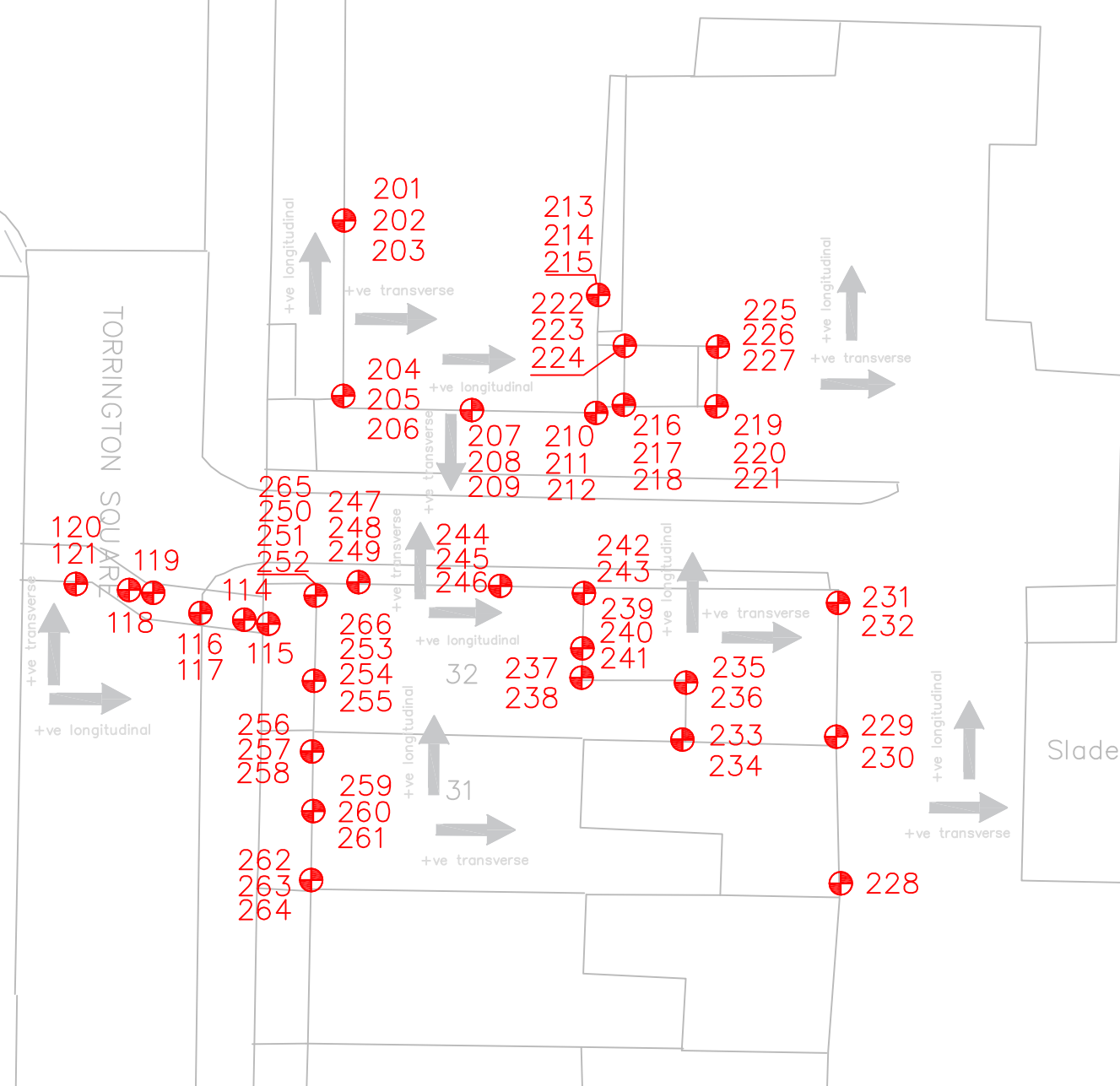
Graph 10 - Precise Level Points on Staircase

Note: +ve value denotes heave, -ve value denotes settlement.





# The Warburg Institute



NOTES:

**Legend:**

- Monitoring target

Coordinate system orientated to be square with elevation of Nos. 32-33 Torrington Square

NO	REVISIONS	DATE	BY
01	Arrows added	06/06/18	DD
	Issued to client	23/05/18	IP

CLIENT

**8 Build**

PROJECT TITLE

**32-33 Torrington Square**

TITLE

**Monitoring 3D Targets Location Plan**

SURVEYED	DRAWN	CHECKED	DATE	SCALE @A3
PL	IP	-	17/05/18	NTS

16 Tiller Court  
Tiller Road  
London E14 8PX  
Tel: (020) 7538 0870  
Fax: (020) 7537 4355  
Email: office@sesltd.uk.com

JOB No	DRAWING No	REV
10215	SES/10215/MON1	01

