



# C305 – Eastern Running Tunnels

## I&M Close Out Report for Bow Church Tunnel (DLR)

CRL Document Number: C305-DSJ-C2-RGN-CRG03-50393

Supplier Document Number:

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Stakeholder submission required: LU  NR  DLR  RfL  LO  Other: \_\_\_\_\_

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This document has been reviewed by the following individual for coordination, compliance, integration and acceptance and is acceptable for transmission to the above stakeholder for the above stated purpose.

Sign: [Redacted] Role: [Redacted] Name: [Redacted] Date: 20/4/16

Sign: \_\_\_\_\_ Role: \_\_\_\_\_ Name: \_\_\_\_\_ Date: \_\_\_\_\_

### 2b. Review by Stakeholder (If required):

Stakeholder Organisation	Job Title	Name	Signature	Date	Acceptance
					<input type="checkbox"/>
					<input type="checkbox"/>

### 3. Acceptance by Crossrail:

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Reviewed/Accepted by (signature): [Redacted]	Date: 12/5/16
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I&M Close out Report for Bow Church Tunnel (DLR) C305-DSJ-C2-RGN-CRG03-50393 Rev 2.0				
<i>C305 Crossrail Eastern Running Tunnels</i>				
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Learning Legacy Document

### 1. CLOSE OUT REPORT PURPOSE

As stated in the specification: C122-OVE-Z4-RSP-CR001-00007 Rev 7.0, the purpose of this close-out report is to summarize the data from the instrumentation included in this document and to relate the recorded movements to the construction activities which produce any observed changes. For construction activities it is intended excavation of the C305 twin bored tunnels and dewatering and construction of cross passages; impacts from other CRL contracts are not included in this report.

The long term readings have been used to demonstrate that the subsequent movement has reached an acceptably stable rate within the accuracy of the system in order to decommission and/or that C305 works are no longer impacting the area concerned.

As stated in the specifications the settlement rate of 2 mm/yr has been defined. Where this is not achieved this report seeks agreement from all parties that the rate is acceptably low enough to cease monitoring and decommission.

### 2. LOCATION OF THE WORKS

All instruments covered by this report are located within the DLR Bow Church Tunnel, in Area 14 between Pudding Mill Lane portal and Stepney Green Shaft, at project chainage 82800.

Drawings showing locations of installed instruments are included as Appendix A of this report.

### 3. DOCUMENTATION SUMMARY

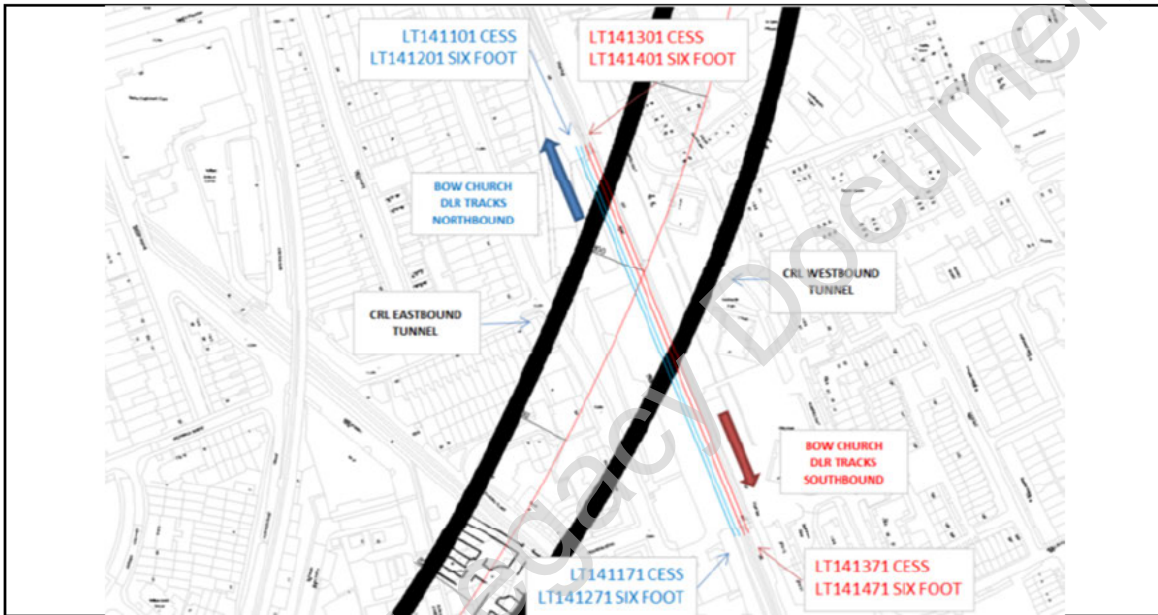
<b>METHOD STATEMENT</b>	<b>Crossrail Number</b>
Method Statement for Instrumentation of DLR Bow Church Tunnel (ATS & Track Levelling)	C305-DSJ-C-GMS-CRG03-50010
<b>INSTALLATION REPORTS</b>	<b>Crossrail Number</b>
I&M Installation Report for ATS & 3D Prism Bow Church Tunnel (DLR)	C305-DSJ-C2-RGN-CRG03-50389
<b>BASELINE REPORT</b>	<b>Crossrail Number</b>
Baseline Monitoring Report DLR Bow Church (*)	C305-DSJ-C2-RGN-CRG03-50133

(\*) Please refer to Appendix C - Corrigendum to Baseline Report

**4. SUMMARY OF INSTALLED INSTRUMENTATION ON SITE**

Monitoring activities have been performed with the following methods:

- Control of DLR Bow Church Tunnel by automated total stations with 3D prisms.
- Control of track (Levelling) movement by manual monitoring at 3 m centres within the influence area of the running tunnel construction. (See figure below showing general location of the tracks )



The total number of instruments installed, as per installation report listed above, was 120 3D prisms.

Appendix B includes detailed information of the installed instrumentation, the average value of the commissioning readings included in Appendix B has been used as a baseline for the relative movements illustrated in the graphs of this report. Appendix B includes the full list of track levelling points with their coordinates.

**5. CONSTRUCTION ACTIVITY**

TBM Passage

DRIVE Z	RINGS	PROJECT CHAINAGE	DATES
Eastbound	365-410	82788-82854	16/10/2013 to 18/10/2013
Westbound	410-450	82734-82797	8/04/2014 to 9/04/2014

No Stoppage Period.

The periods of TBM passage and stoppage are related to the rings located close to the instrumentation included in this close out report.

**6. METHODOLOGY**

To determine the settlement rate the following methodology has been used. A Linear Regression has been applied for a defined period using long term readings is recorded after TBM construction. This uses the following formula:

$$b = \frac{\sum_{i=1}^n (X_i - \bar{X}_i) \cdot (Y_i - \bar{Y}_i)}{\sum_{i=1}^n (X_i - \bar{X}_i)^2}$$

Where:

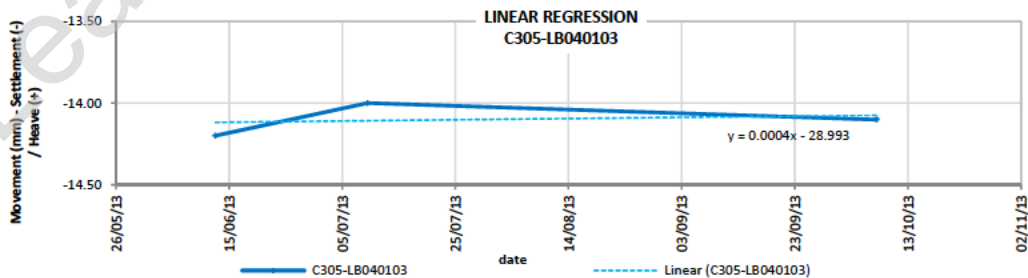
- B =gradient
- X = date
- Y = vertical movement

From this, the settlement rate per day can be calculated and rate per year determined (negative value is for settlement, positive is for heave). For these values, the percentage at or below 2 mm/yr will be used to determine the trend of the section/area being considered. Also for comparison, values at or below 3mm/year are presented to highlight that the rate is close to achieving the 2 mm/yr.

Note the percentages of settlement rate presented in the sections below refer to values rounded to the nearest integer.

One example of this calculation can be seen below for the socket C305-LB040103 and its projection included in this Close Out Report.

	Registered movement (mm)			RATE mm/year
	12/06/2013	09/07/2013	07/10/2013	
C305-LB040103	-14.20	-14.00	-14.10	0.146



CALCULATION - C305-LB040103

$X_i$	$Y_i$	$X_i - \bar{X}_i$	$Y_i - \bar{Y}_i$	$(X_i - \bar{X}_i)^2$	$(X_i - \bar{X}_i) \cdot (Y_i - \bar{Y}_i)$
12/06/2013	-14.2	-47.94	-0.10	2298.67	4.794
09/07/2013	-14	-21.03	0.10	442.17	-2.103
07/10/2013	-14.1	68.97	0.00	4757.17	0.000

$\bar{X}_i$	41485.53	
$\bar{Y}_i$	-14.10	
$\sum_{i=1}^n (X_i - \bar{X}_i)^2$	7498.00	(2)
$\sum_{i=1}^n (X_i - \bar{X}_i) \cdot (Y_i - \bar{Y}_i)$	2.692	(1)
m (SLOPE)	(1)/(2)	0.0004
Rate (mm/year)	m * 365	0.146

7. SUMMARY OF THE DATA

The methodology explained in section 6 is applied here to the track levelling points. Additionally, graphs of deflection, cant and twist of the Northbound and Southbound rail track are presented.

3D prisms monitoring data are illustrated in a chart format.

Note: For the following data plots #N/A refers to instances where readings were not taken for that sensor (e.g. damaged sensor, no access, etc.)

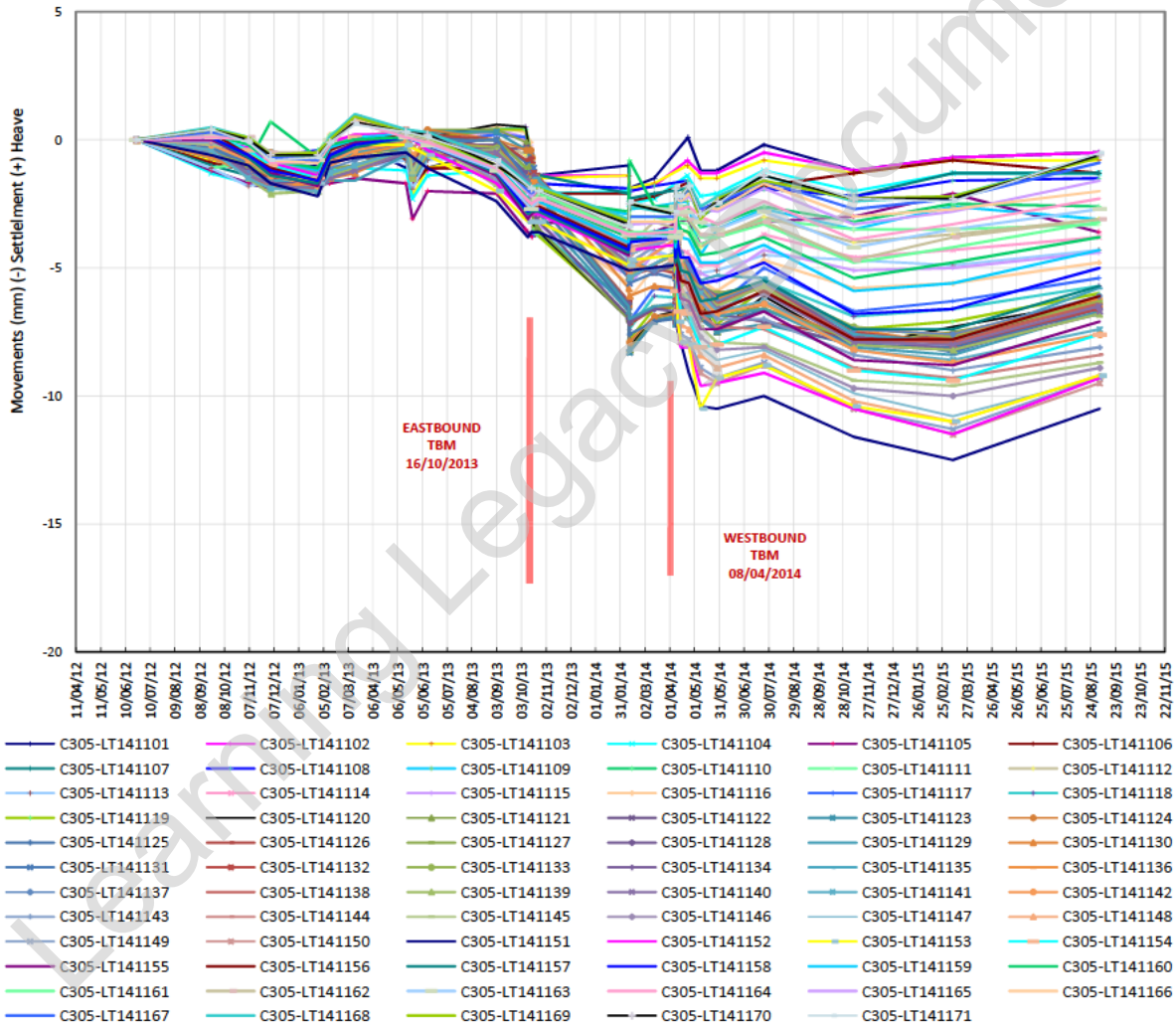
**LEVELLING OF THE DLR NORTHBOUND TRACK**

This section will present time-movement charts for a single rail (cess rail) per track (Northbound and Southbound in a sequence).

**C305-LT141101 – C305-LT141171**

The graph presented below shows the readings from the levelling points of this array. A maximum settlement of 6 mm is recorded after the Eastbound TBM transit and 12 mm is after Westbound TBM transit.

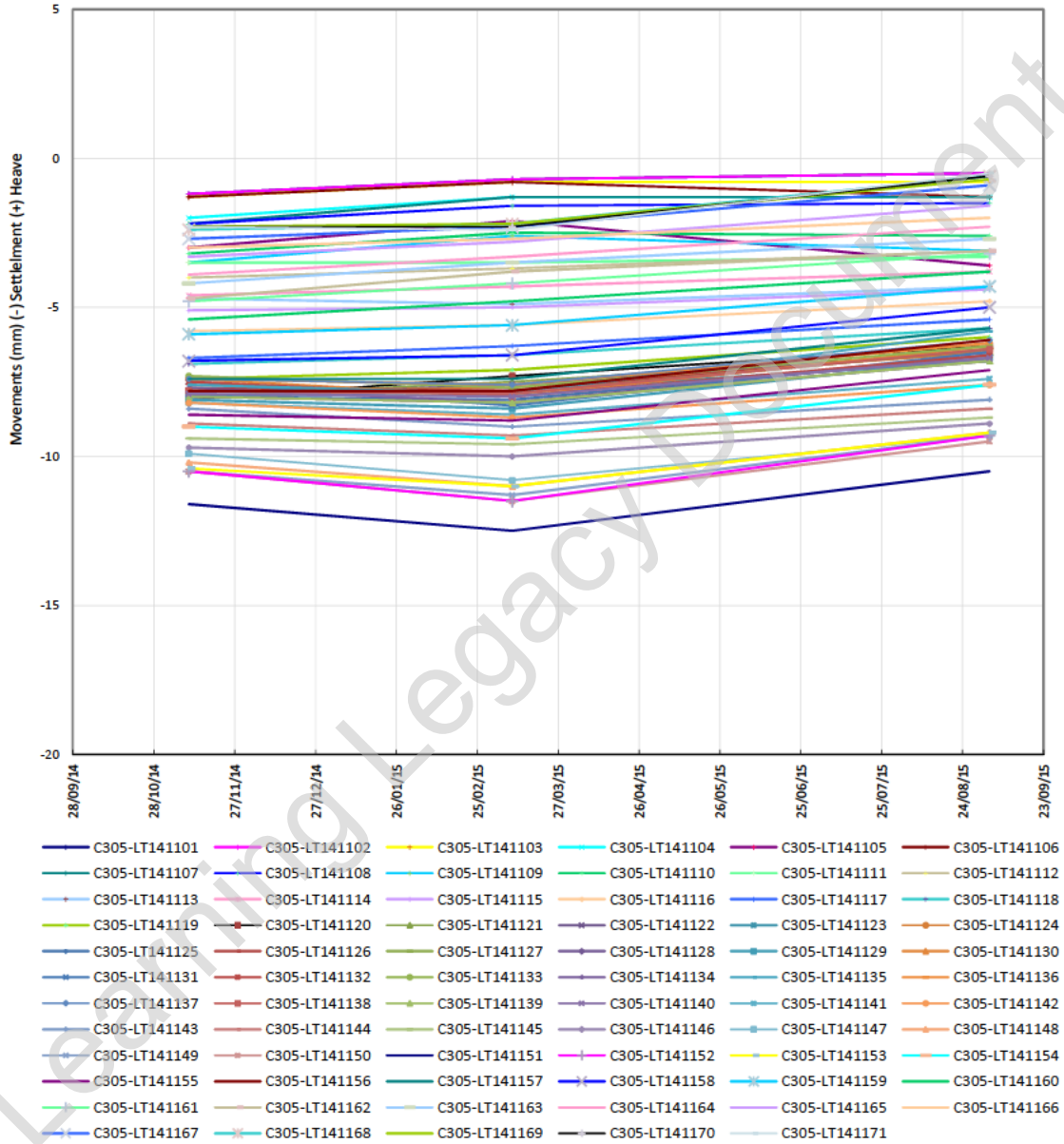
**AREA 14 C305-LT141101 – C305-LT141171  
 DLR BOW CHURCH NORTHBOUND TRACK (Cess-LEVELLING)**





The next plot shows the trend line adjustment for the levelling points in this array.

### DLR BOW CHURCH NORTHBOUND TRACK (Cess-LEVELING)

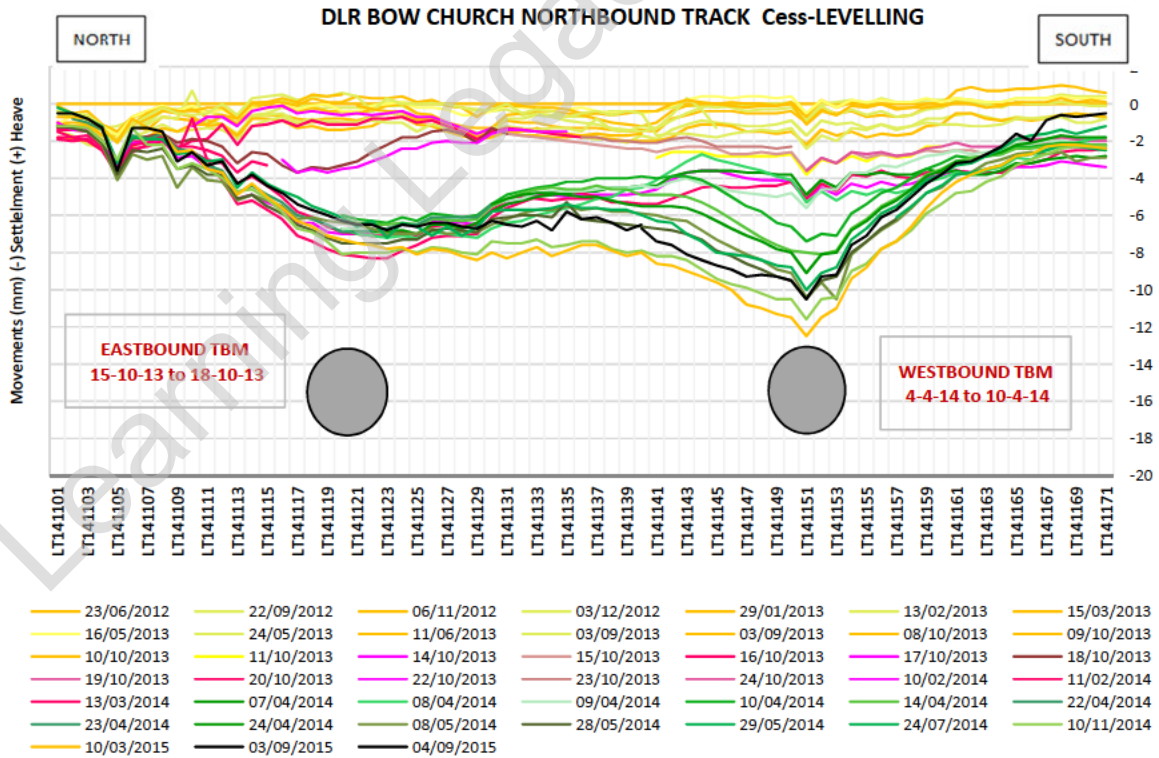
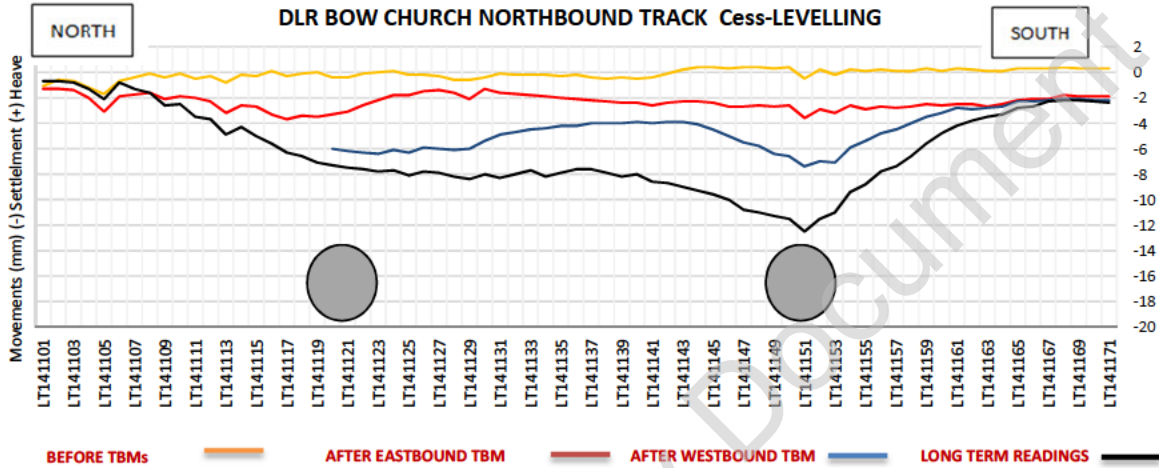


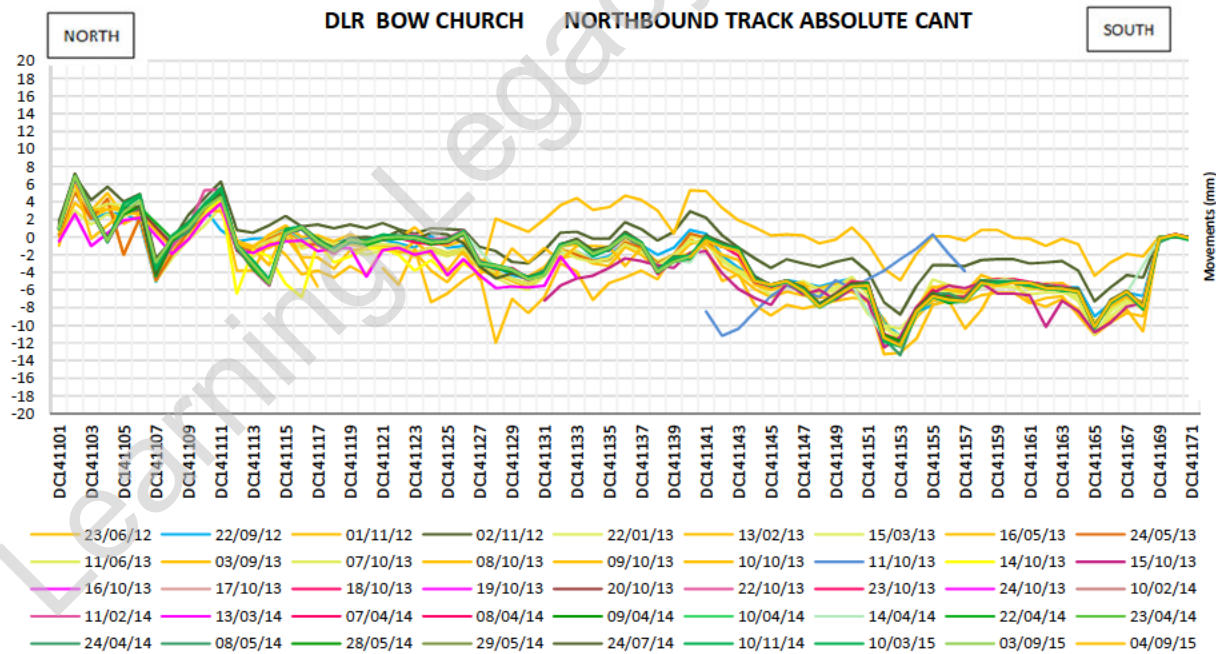
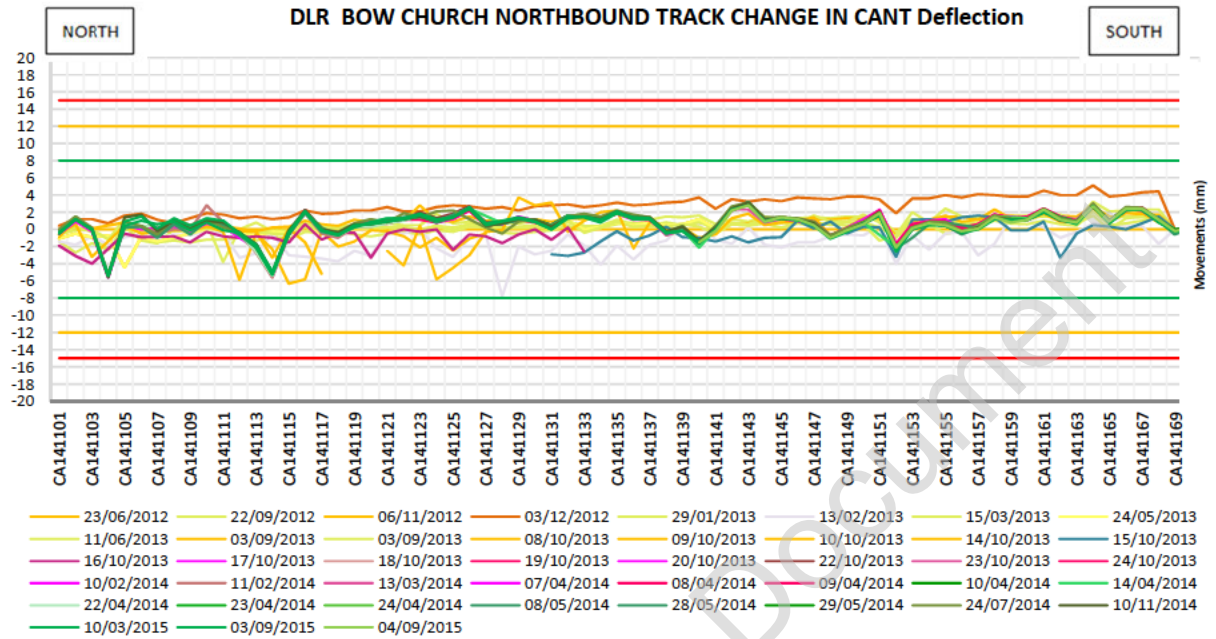
The table below illustrates the annual settlement rate for the levelling points in this array.

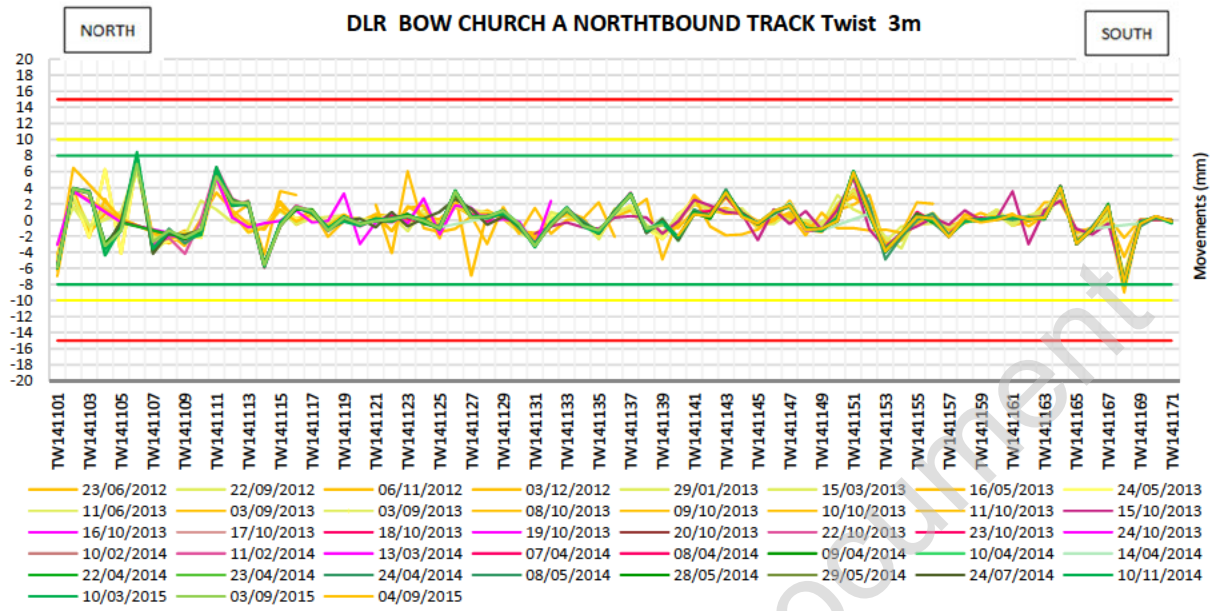
	Registered movement (mm)			mm/year
	10/11/2014	10/03/2015	03/09/2015	
C305-LT141101	-1.20	-0.70	-0.50	0.827
C305-LT141102	-1.20	-0.70	-0.50	0.827
C305-LT141103	-1.30	-0.80	-0.80	0.568
C305-LT141104	-2.00	-1.30	-1.30	0.795
C305-LT141105	-3.00	-2.10	-3.60	-0.915
C305-LT141106	-1.30	-0.80	-1.30	-0.078
C305-LT141107	-2.20	-1.30	-1.30	1.023
C305-LT141108	-2.20	-1.60	-1.50	0.811
C305-LT141109	-3.50	-2.60	-3.10	0.377
C305-LT141110	-3.20	-2.50	-2.60	0.666
C305-LT141111	-3.50	-3.50	-3.30	0.258
C305-LT141112	-4.00	-3.70	-3.10	1.116
C305-LT141113	-4.70	-4.90	-4.30	0.548
C305-LT141114	-4.60	-4.30	-3.80	0.987
C305-LT141115	-5.10	-5.00	-4.40	0.889
C305-LT141116	-5.80	-5.60	-4.80	1.261
C305-LT141117	-6.70	-6.30	-5.40	1.617
C305-LT141118	-6.90	-6.60	-5.70	1.503
C305-LT141119	-7.40	-7.10	-6.00	1.762
C305-LT141120	-8.10	-7.30	-6.30	2.201
C305-LT141121	-8.00	-7.50	-6.50	1.860
C305-LT141122	-8.00	-7.60	-6.50	1.875
C305-LT141123	-8.00	-7.80	-6.80	1.519
C305-LT141124	-7.80	-7.70	-6.50	1.664
C305-LT141125	-8.00	-8.10	-6.60	1.824
C305-LT141126	-7.70	-7.80	-6.40	1.695
C305-LT141127	-7.80	-7.90	-6.40	1.824
C305-LT141128	-8.00	-8.20	-6.60	1.839
C305-LT141129	-8.10	-8.40	-6.70	1.855
C305-LT141130	-7.40	-8.00	-6.30	1.514
C305-LT141131	-7.50	-8.30	-6.50	1.416
C305-LT141132	-7.50	-8.00	-6.60	1.240
C305-LT141133	-7.30	-7.70	-6.30	1.354
C305-LT141134	-7.70	-8.20	-6.80	1.240
C305-LT141135	-7.60	-7.90	-5.80	2.372
C305-LT141136	-7.40	-7.60	-6.20	1.581
C305-LT141137	-7.40	-7.60	-6.10	1.710
C305-LT141138	-7.80	-7.90	-6.40	1.824
C305-LT141139	-8.00	-8.20	-6.80	1.581
C305-LT141140	-7.90	-8.00	-6.70	1.566
C305-LT141141	-8.20	-8.60	-7.40	1.096
C305-LT141142	-8.20	-8.70	-7.60	0.853
C305-LT141143	-8.40	-9.00	-8.10	0.481
C305-LT141144	-8.90	-9.30	-8.40	0.708
C305-LT141145	-9.40	-9.60	-8.70	0.935
C305-LT141146	-9.70	-10.00	-8.90	1.080
C305-LT141147	-9.90	-10.80	-9.30	0.915
C305-LT141148	-10.20	-11.00	-9.20	1.416
C305-LT141149	-10.50	-11.30	-9.30	1.674
C305-LT141150	-10.50	-11.50	-9.50	1.447
C305-LT141151	-11.60	-12.50	-10.50	1.561
C305-LT141152	-10.50	-11.50	-9.30	1.705
C305-LT141153	-10.40	-11.00	-9.20	1.643
C305-LT141154	-9.00	-9.40	-7.60	1.871
C305-LT141155	-8.60	-8.80	-7.10	1.969
C305-LT141156	-7.80	-7.80	-6.10	2.196
C305-LT141157	-7.40	-7.40	-5.70	2.196
C305-LT141158	-6.80	-6.60	-5.00	2.294
C305-LT141159	-5.90	-5.60	-4.30	2.020
C305-LT141160	-5.40	-4.80	-3.80	1.974
C305-LT141161	-4.80	-4.20	-3.20	1.974
C305-LT141162	-4.70	-3.80	-3.10	1.927
C305-LT141163	-4.20	-3.50	-2.70	1.829
C305-LT141164	-3.90	-3.30	-2.30	1.974
C305-LT141165	-3.30	-2.80	-1.60	2.118
C305-LT141166	-3.00	-2.70	-2.00	1.245
C305-LT141167	-2.70	-2.30	-0.90	2.263
C305-LT141168	-2.40	-2.20	-0.60	2.294
C305-LT141169	-2.30	-2.20	-0.70	2.051
C305-LT141170	-2.30	-2.30	-0.60	2.196
C305-LT141171	-2.30	-2.40	-0.50	2.341
	Rate less than -2.5 mm/year	% less 2 mm/ year		100%
	Rate greater than -3.5 mm/year	% less 3 mm/ year		100%

The percentage of the levelling points with a settlement rate less than 2 mm/year is 100%

**DEFLECTION GRAPHS OF THE DLR NORTHBOUND TRACK**







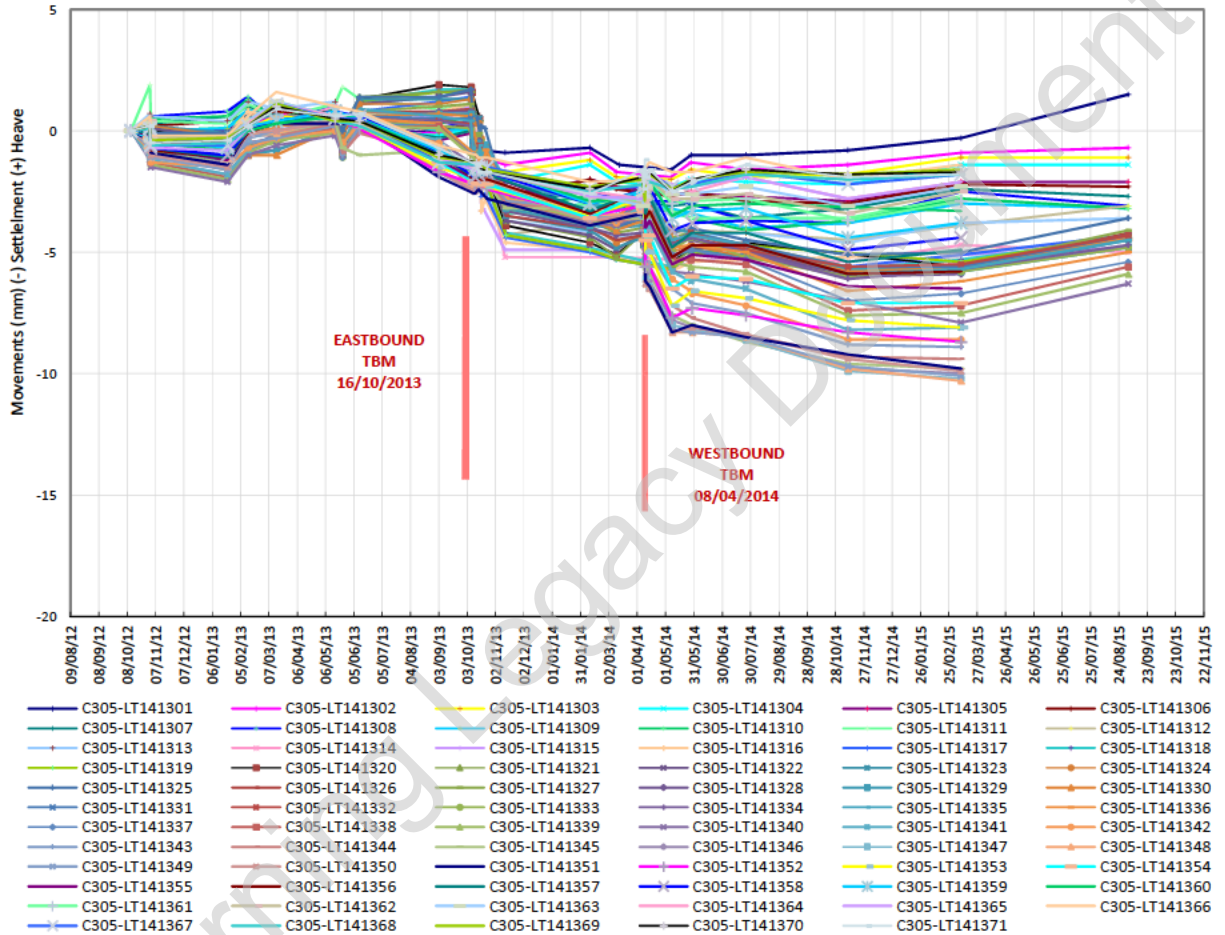
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LEVELLING OF THE DLR SOUTHBOUND TRACK

**C305-LT141301 – C305-LT141371**

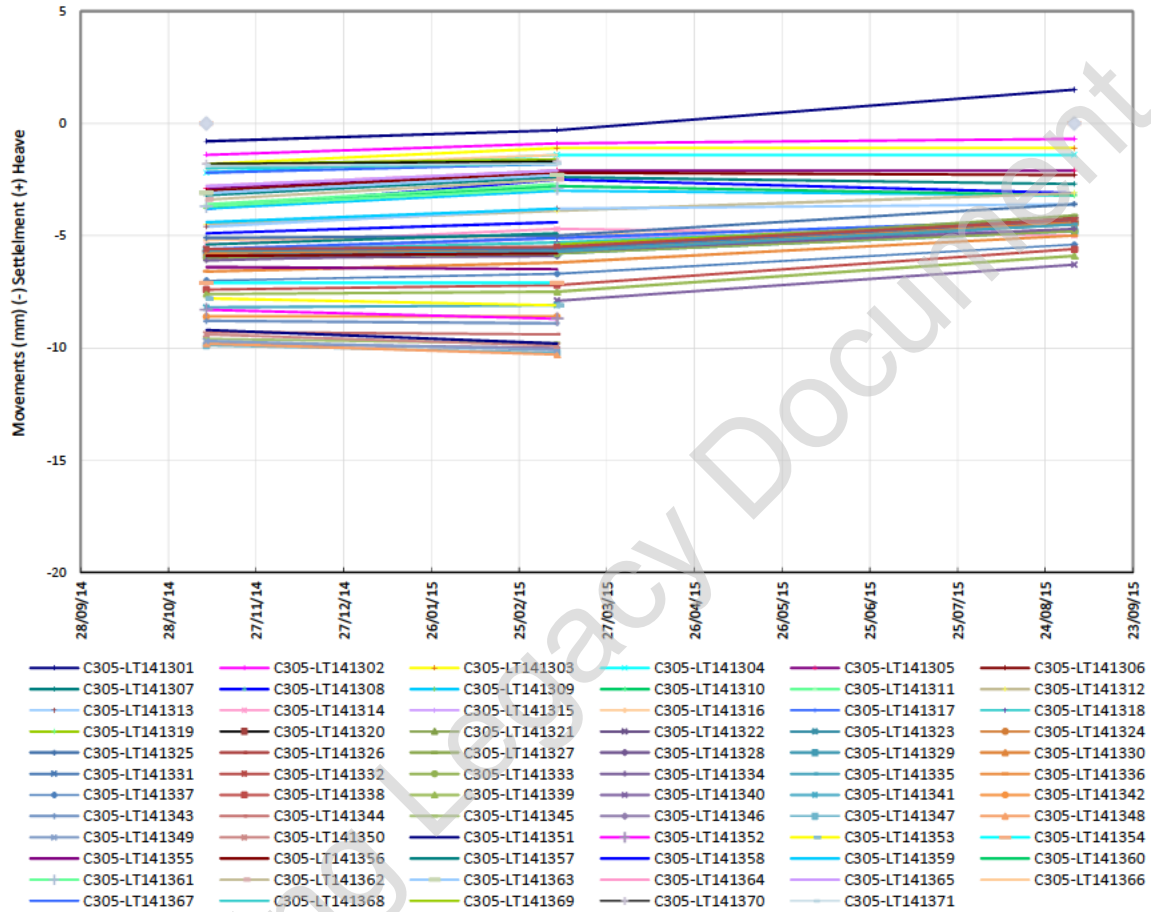
The graph presented below shows the readings from the levelling points of this array. A maximum settlement of 6 mm is recorded after the Eastbound TBM transit and 9 mm is after Westbound TBM transit.

**AREA 14 C305-LT141301 – C305-LT141371**  
**DLR BOW CHURCH SOUTHBOUND TRACK (Cess-LEVELLING)**



The next plot shows the trend line adjustment for the levelling points in this array.

**DLR BOW CHURCH SOUTHBOUND TRACK (Cess-LEVELLING)**



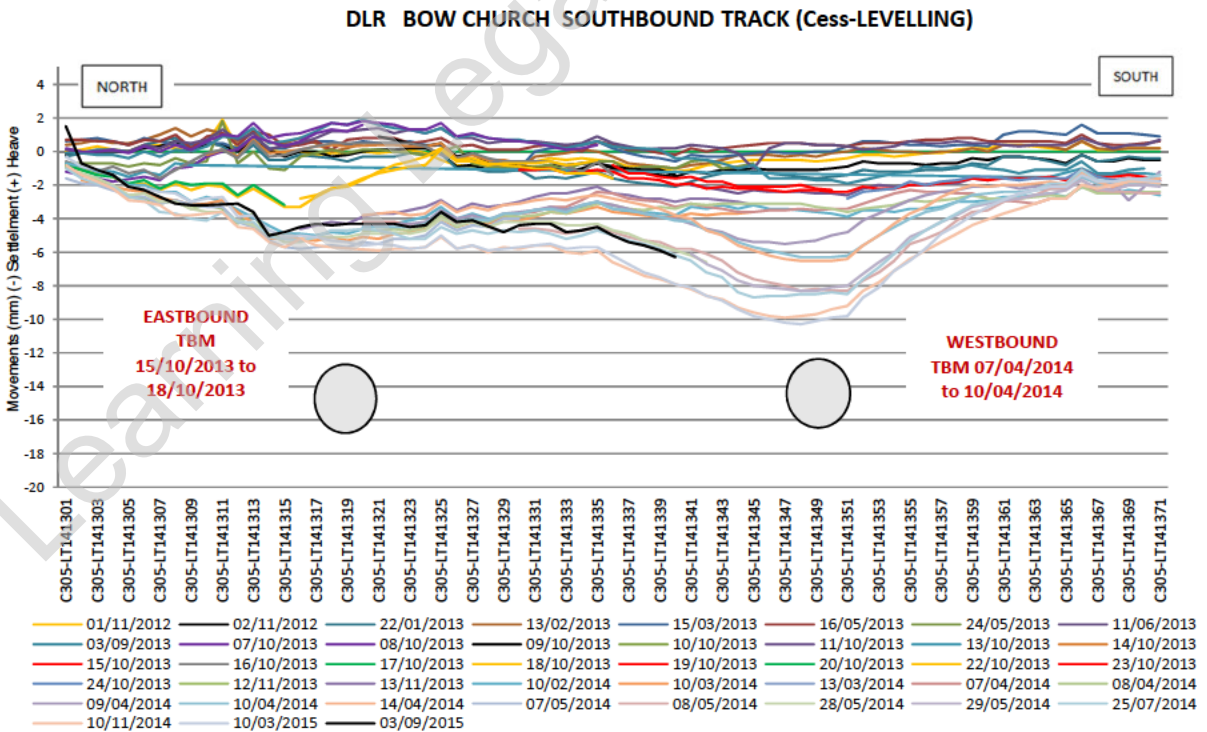
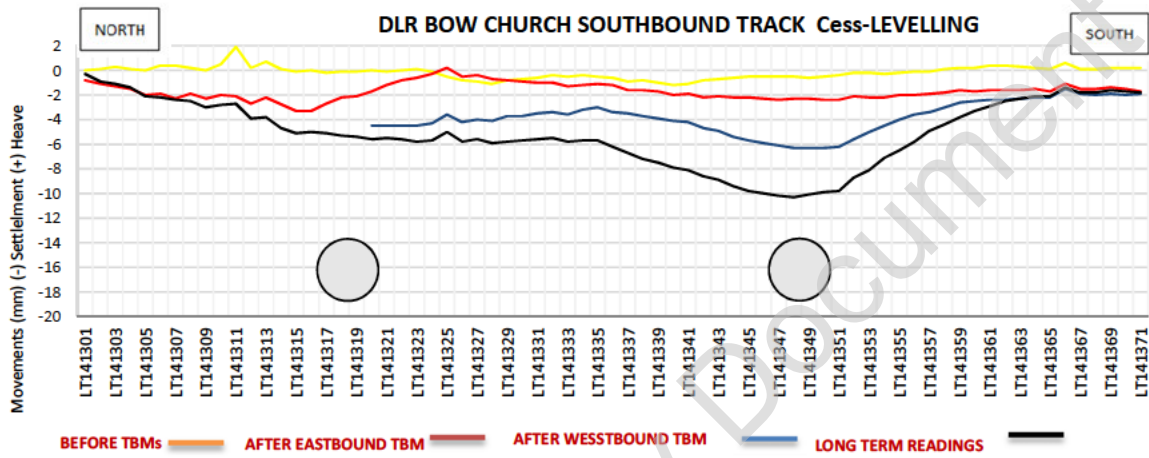
The table below illustrates the annual settlement rate for the levelling points in this array.

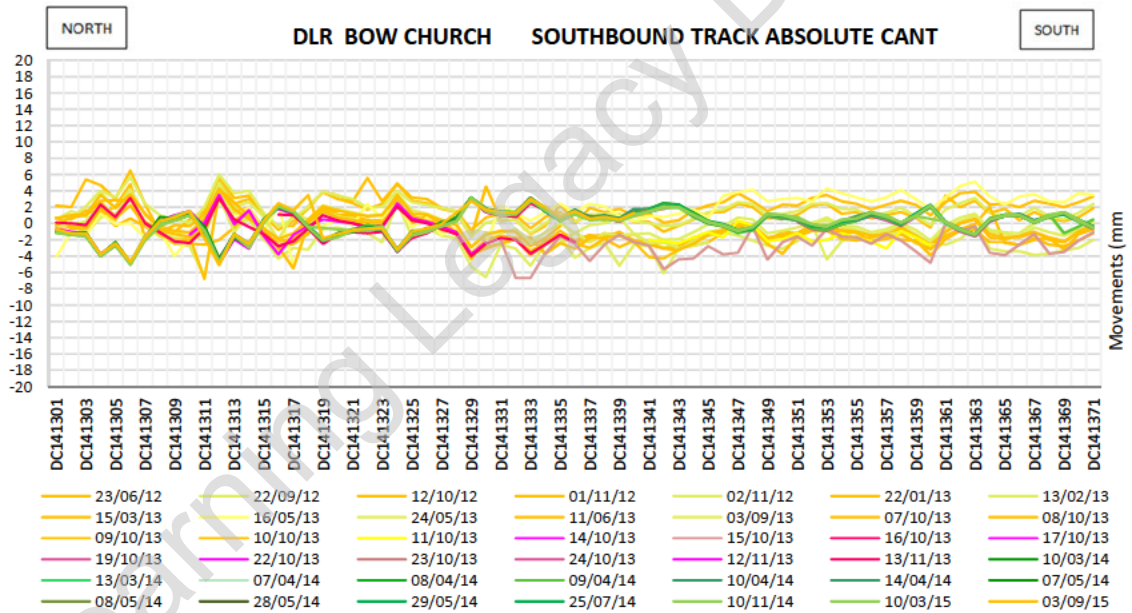
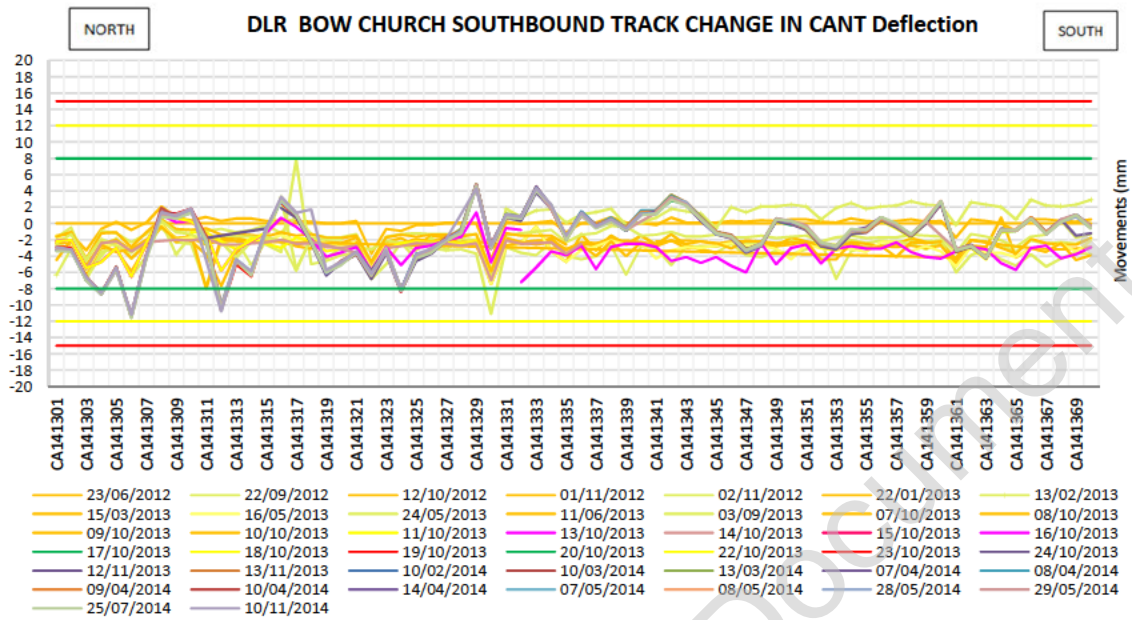
	Registered movement (mm)			mm/year
	10/11/2014	10/03/2015	03/09/2015	
C305-LT141301	-0.80	-0.30	1.50	2.893
C305-LT141302	-1.40	-0.90	-0.70	0.827
C305-LT141303	-1.80	-1.10	-1.10	0.795
C305-LT141304	-2.20	-1.40	-1.40	0.909
C305-LT141305	-2.90	-2.10	-2.10	0.909
C305-LT141306	-3.00	-2.20	-2.30	0.780
C305-LT141307	-3.20	-2.40	-2.70	0.522
C305-LT141308	-3.80	-2.50	-3.10	0.702
C305-LT141309	-3.80	-3.00	-3.20	0.651
C305-LT141310	-3.70	-2.80	-3.20	0.506
C305-LT141311	-3.60	-2.70	#N/A	2.738
C305-LT141312	-4.50	-3.90	-3.10	1.715
C305-LT141313	-4.60	-3.80	-3.60	1.167
C305-LT141314	-5.40	-4.70	-5.00	0.408
C305-LT141315	-5.70	-5.10	-4.80	1.069
C305-LT141316	-5.20	-5.00	-4.50	0.873
C305-LT141317	-5.60	-5.10	-4.30	1.602
C305-LT141318	-5.70	-5.30	-4.40	1.617
C305-LT141319	#N/A	-5.40	-4.30	2.268
C305-LT141320	#N/A	-5.60	-4.30	2.681
C305-LT141321	-5.90	-5.50	-4.30	2.005
C305-LT141322	-5.80	-5.60	-4.30	1.907
C305-LT141323	-5.80	-5.80	-4.50	1.679
C305-LT141324	-5.70	-5.70	-4.40	1.679
C305-LT141325	-5.10	-5.00	-3.60	1.922
C305-LT141326	-5.80	-5.80	-4.20	2.067
C305-LT141327	-5.60	-5.60	-4.10	1.938
C305-LT141328	-6.00	-5.90	#N/A	0.304
C305-LT141329	-5.70	-5.80	-4.80	1.178
C305-LT141330	-5.80	-5.70	-4.40	1.793
C305-LT141331	-5.60	-5.60	-4.30	1.679
C305-LT141332	-5.60	-5.50	-4.30	1.664
C305-LT141333	-6.00	-5.80	-4.80	1.519
C305-LT141334	-6.10	-5.70	-4.70	1.746
C305-LT141335	-5.90	-5.70	-4.50	1.777
C305-LT141336	-6.60	-6.20	-5.00	2.005
C305-LT141337	-7.00	-6.70	-5.40	2.020
C305-LT141338	-7.40	-7.20	-5.60	2.294
C305-LT141339	-7.60	-7.50	-5.90	2.180
C305-LT141340	#N/A	-7.90	-6.30	3.299
C305-LT141341	-8.20	-8.10	#N/A	0.304
C305-LT141342	-8.60	-8.60	#N/A	0.000
C305-LT141343	8.80	-8.90	#N/A	-0.304
C305-LT141344	-9.30	-9.40	#N/A	-0.304
C305-LT141345	-9.60	-9.80	#N/A	-0.608
C305-LT141346	-9.80	-10.00	#N/A	-0.608
C305-LT141347	-9.90	-10.20	#N/A	-0.912
C305-LT141348	-9.80	-10.30	#N/A	-1.521
C305-LT141349	-9.70	-10.10	#N/A	-1.217
C305-LT141350	-9.40	-9.90	#N/A	-1.521
C305-LT141351	-9.20	-9.80	#N/A	-1.825
C305-LT141352	-8.30	-8.70	#N/A	-1.217
C305-LT141353	-7.80	-8.10	#N/A	-0.912
C305-LT141354	-7.10	-7.10	#N/A	0.000
C305-LT141355	-6.40	-6.50	#N/A	-0.304
C305-LT141356	-5.90	-5.80	#N/A	0.304
C305-LT141357	-5.40	-4.90	#N/A	1.521
C305-LT141358	-4.90	-4.40	#N/A	1.521
C305-LT141359	-4.40	-3.80	#N/A	1.825
C305-LT141360	#N/A	-3.30	#N/A	#N/A
C305-LT141361	-3.70	-2.90	#N/A	2.433
C305-LT141362	-3.40	-2.50	#N/A	2.738
C305-LT141363	-3.10	-2.30	#N/A	2.433
C305-LT141364	-2.80	-2.10	#N/A	2.129
C305-LT141365	-2.80	-2.10	#N/A	2.129
C305-LT141366	-2.00	-1.40	#N/A	1.825
C305-LT141367	-2.20	-1.80	#N/A	1.217
C305-LT141368	-2.00	-1.80	#N/A	0.608
C305-LT141369	-1.80	-1.60	#N/A	0.608
C305-LT141370	-1.80	-1.70	#N/A	0.304
C305-LT141371	-1.90	-1.80	#N/A	0.304
	Rate less than -2.5 mm/year		% less 2 mm/ year	100%
	Rate greater than -3.5 mm/year		% less 3 mm/ year	100%

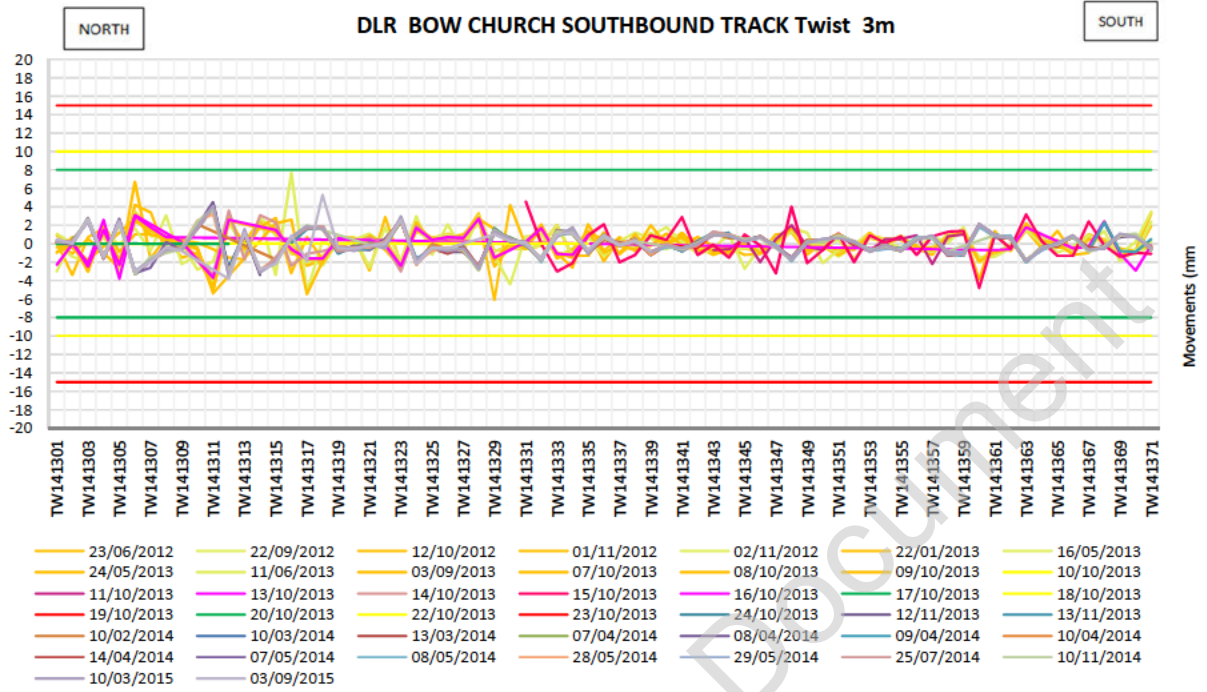


The percentage of the levelling points with a settlement rate less than 2 mm/year is 100%

**DEFLECTION GRAPHS OF THE DLR SOUTHBOUND TRACK**





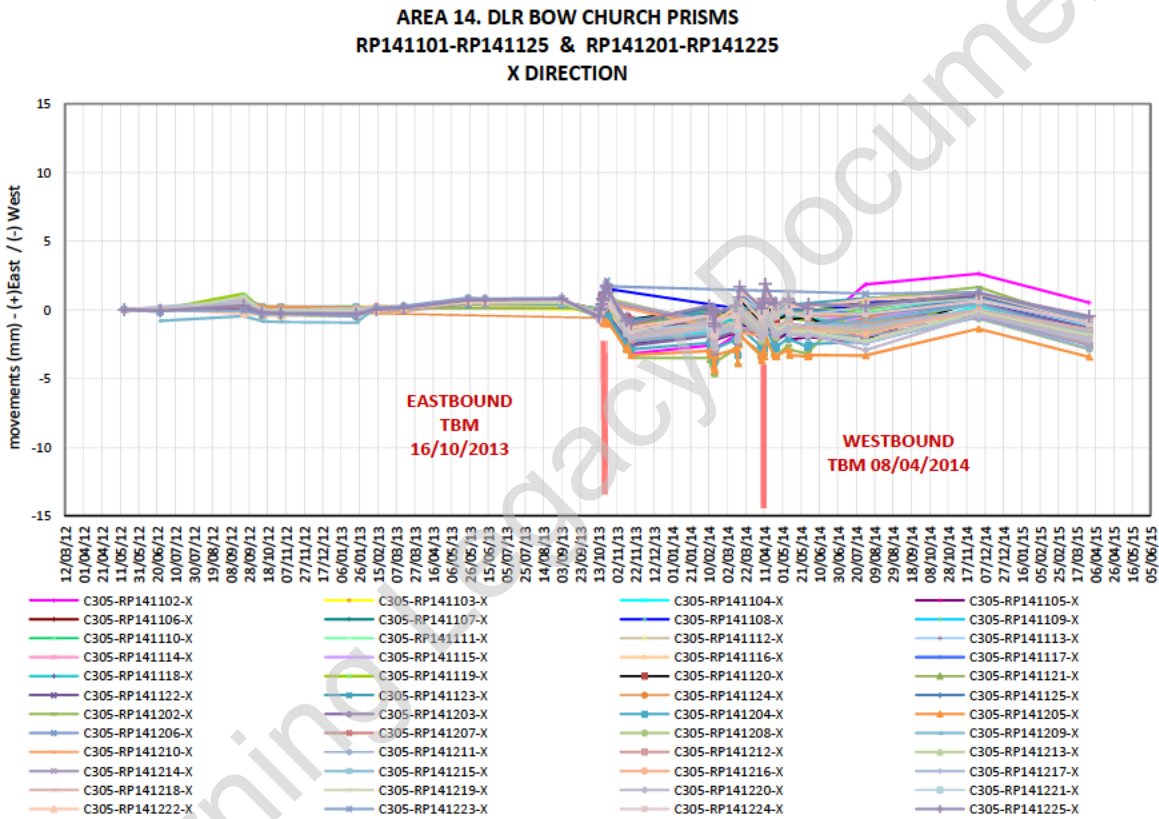


**3D PRISMS**

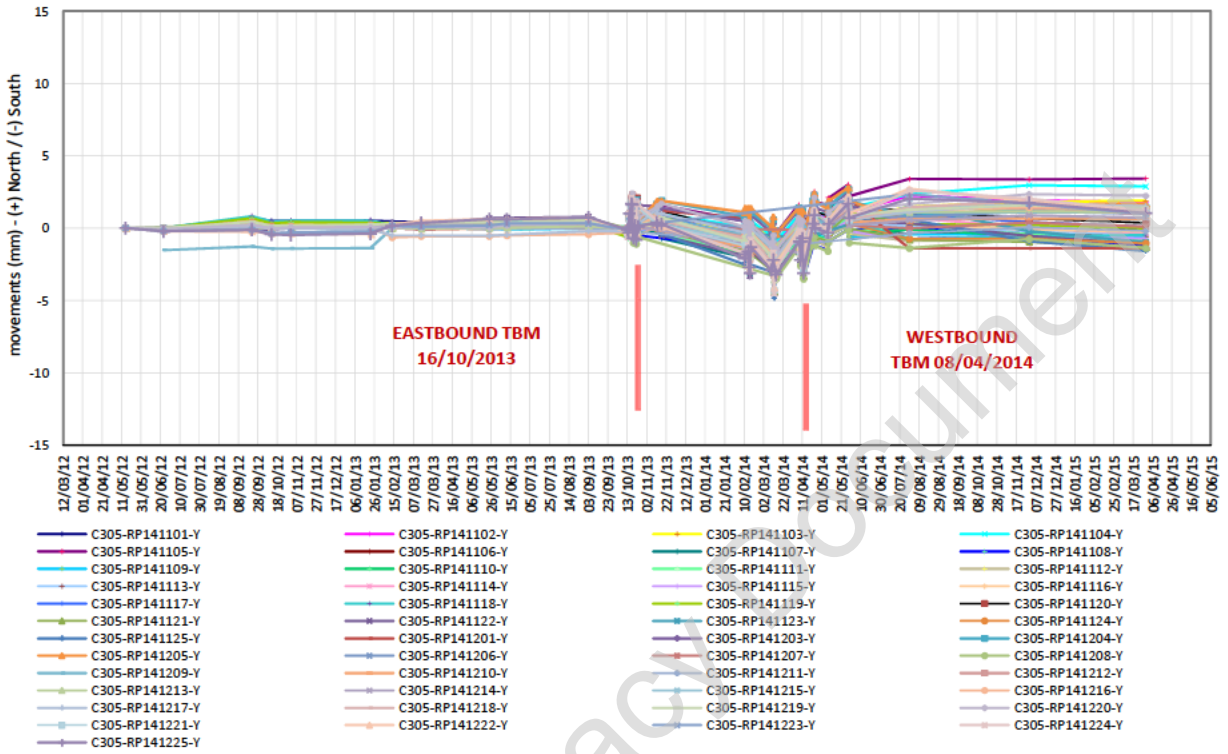
In order to clarify the movement/time charts, monitoring data will be presented in three different sections: north, central and south tunnel respectively.

To note the ATS system was battery powered due to the impossibility of connection to DLR or third party power line, although sought in many instances. Readings during TBM transit were taken hourly, however there may be some reading gaps when changing the battery of the ATS was affected by longer time for rail access and effective battery replacement.

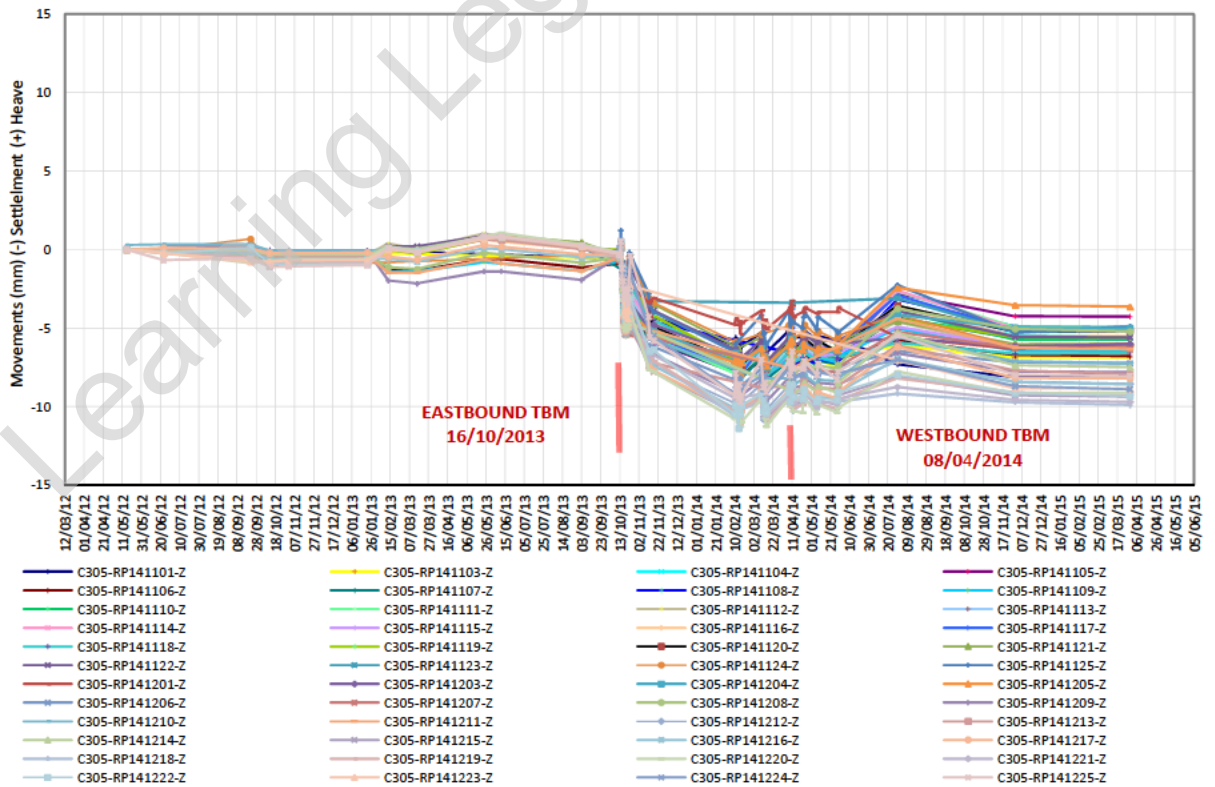
**NORTH SECTION: C305-RP141101 to C305-RP141125 & C305- RP141201 to C305-RP141225**



AREA 14. DLR BOW CHURCH PRISMS  
RP141101-RP141125 & RP141201-RP141225  
Y DIRECTION



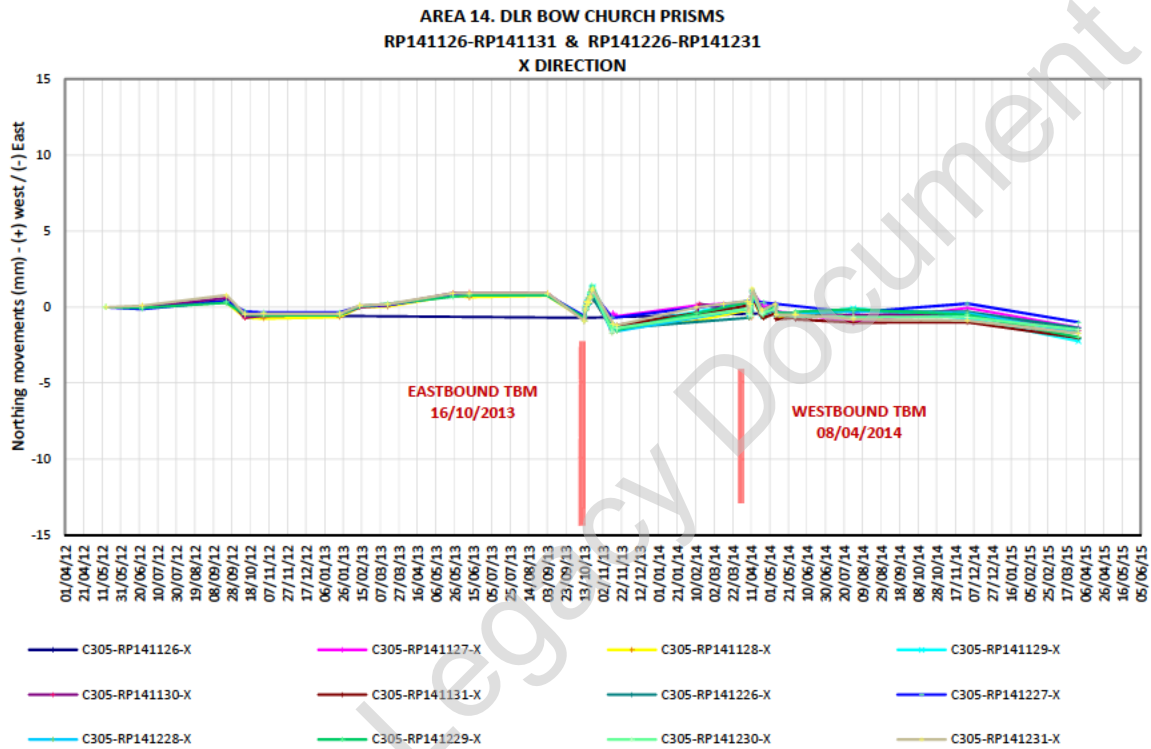
AREA 14. DLR BOW CHURCH PRISMS  
RP141101-RP141125 & RP141201-RP141225  
Z DIRECTION



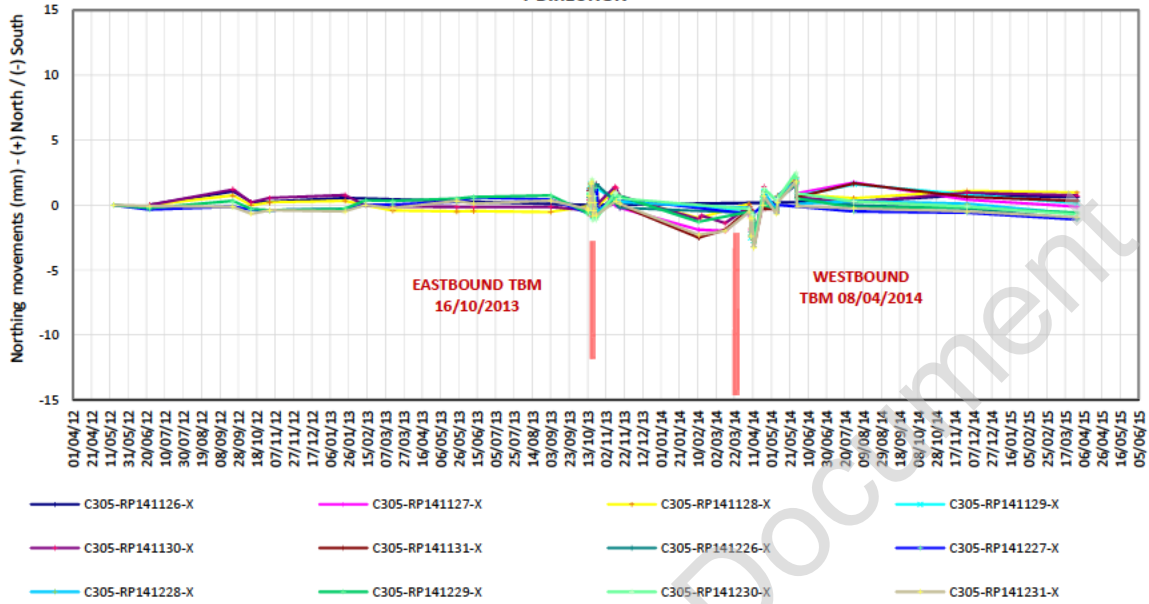
No relevant movements have been observed in X Axis and Y Axis.

Settlement due to EB TBM is approx. 11mm, apparently no settlement due to WB TBM. Settlement in the long term is approximately 10mm.

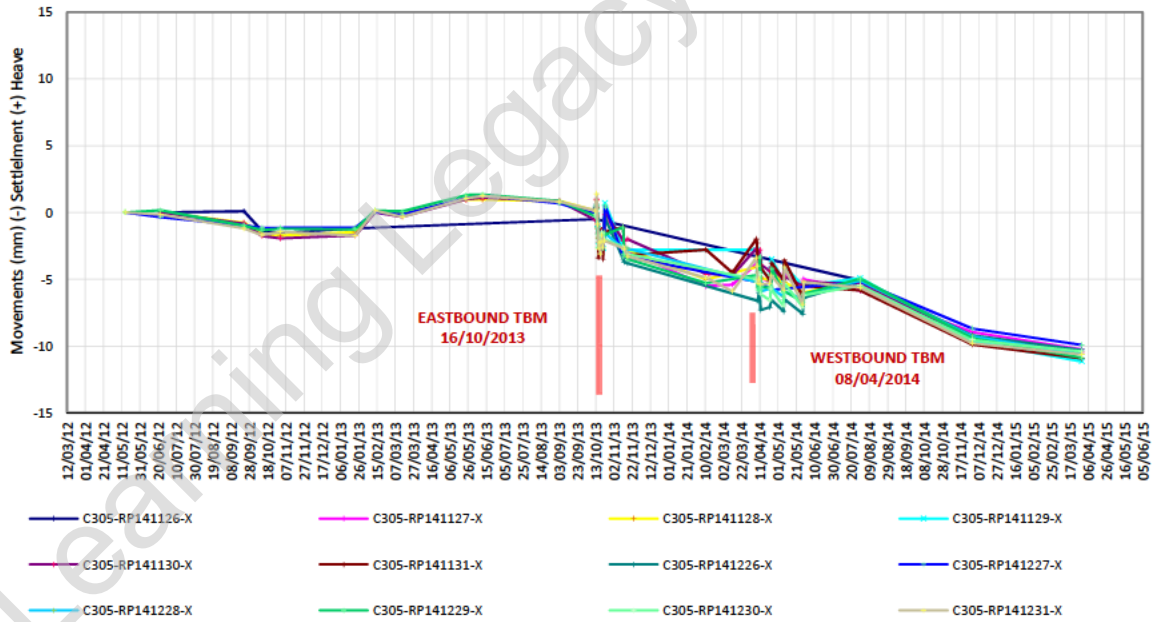
**CENTRAL SECTION: C305-RP141126 to C305-RP141131 & C305- RP141226 to C305-RP141231**



AREA 14. DLR BOW CHURCH PRISMS  
 RP141126-RP141131 & RP141226-RP141231  
 Y DIRECTION



AREA 14. DLR BOW CHURCH PRISMS  
 RP141126-RP141131 & RP141226-RP141231  
 Z DIRECTION

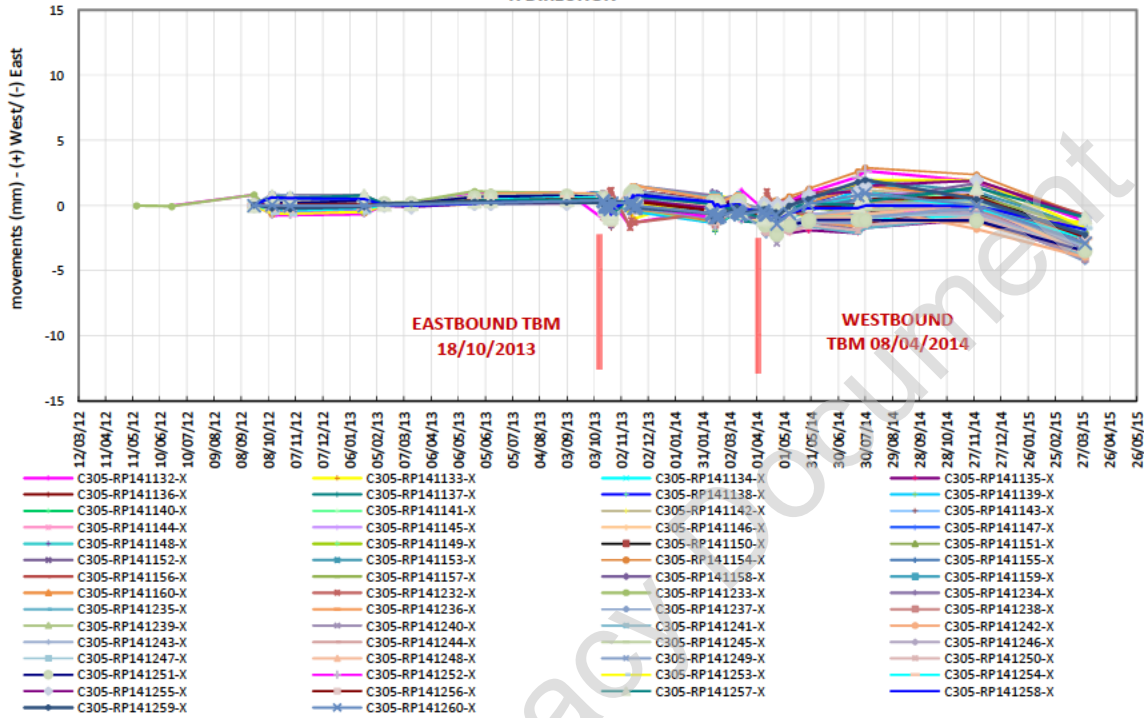


No relevant movements have been observed in X Axis and Y Axis.

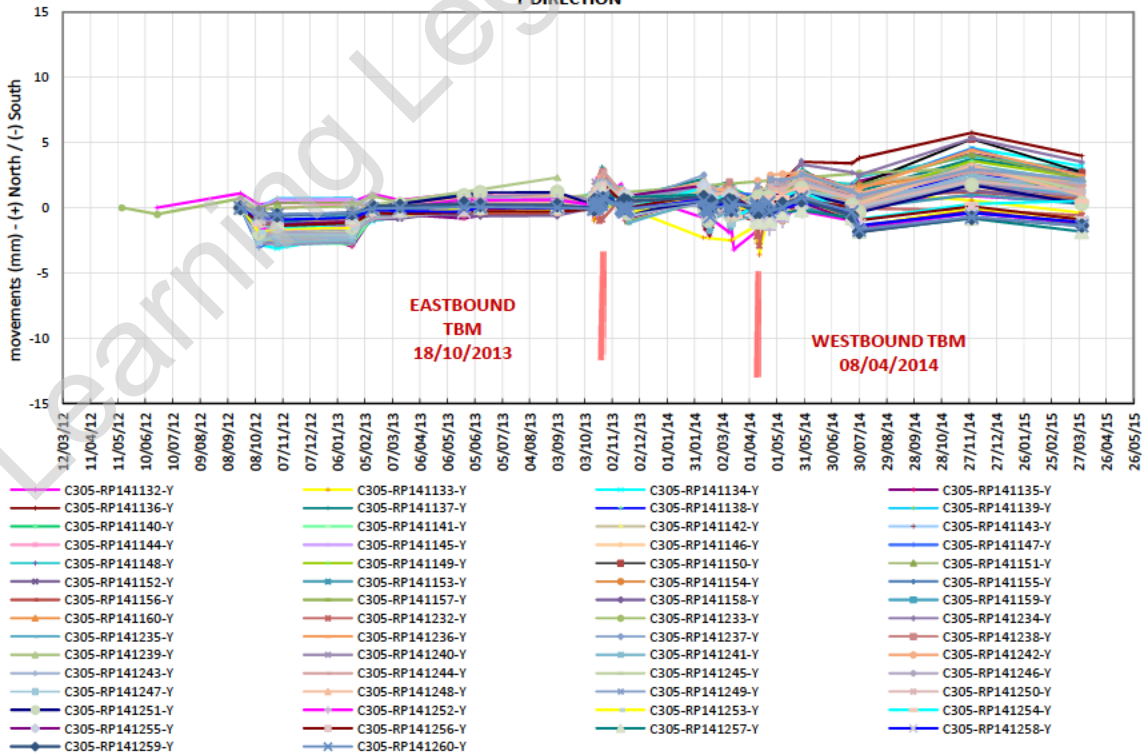
Array has been affected by EB and WB TBM excavation. Settlement in the long term is approximately 11mm.

**SOUTH SECTION: C305-RP141132 to C305-RP141160 & C305- RP141232 to C305-RP141260**

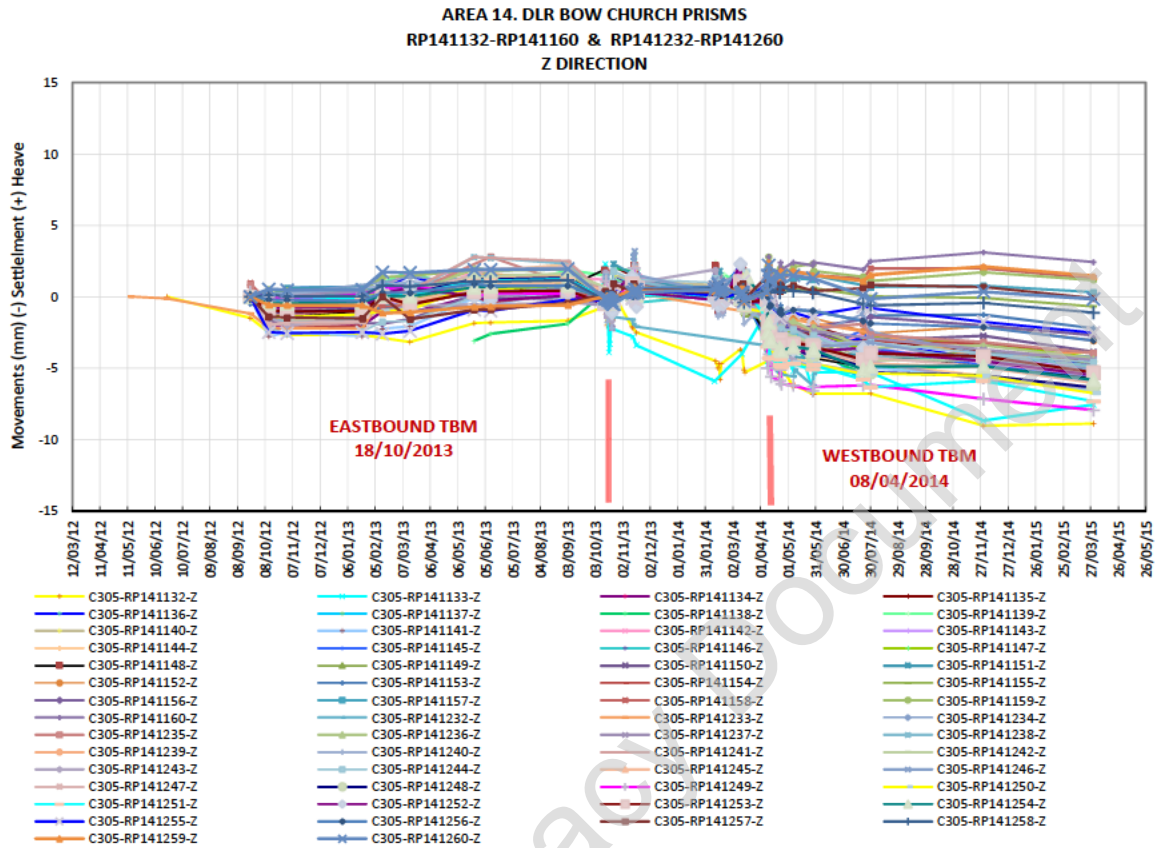
**AREA 14. DLR BOW CHURCH PRISMS  
 RP141132-RP141160 & RP141232-RP141260  
 X DIRECTION**



**AREA 14. DLR BOW CHURCH PRISMS  
 RP141132-RP141160 & RP141232-RP141260  
 Y DIRECTION**







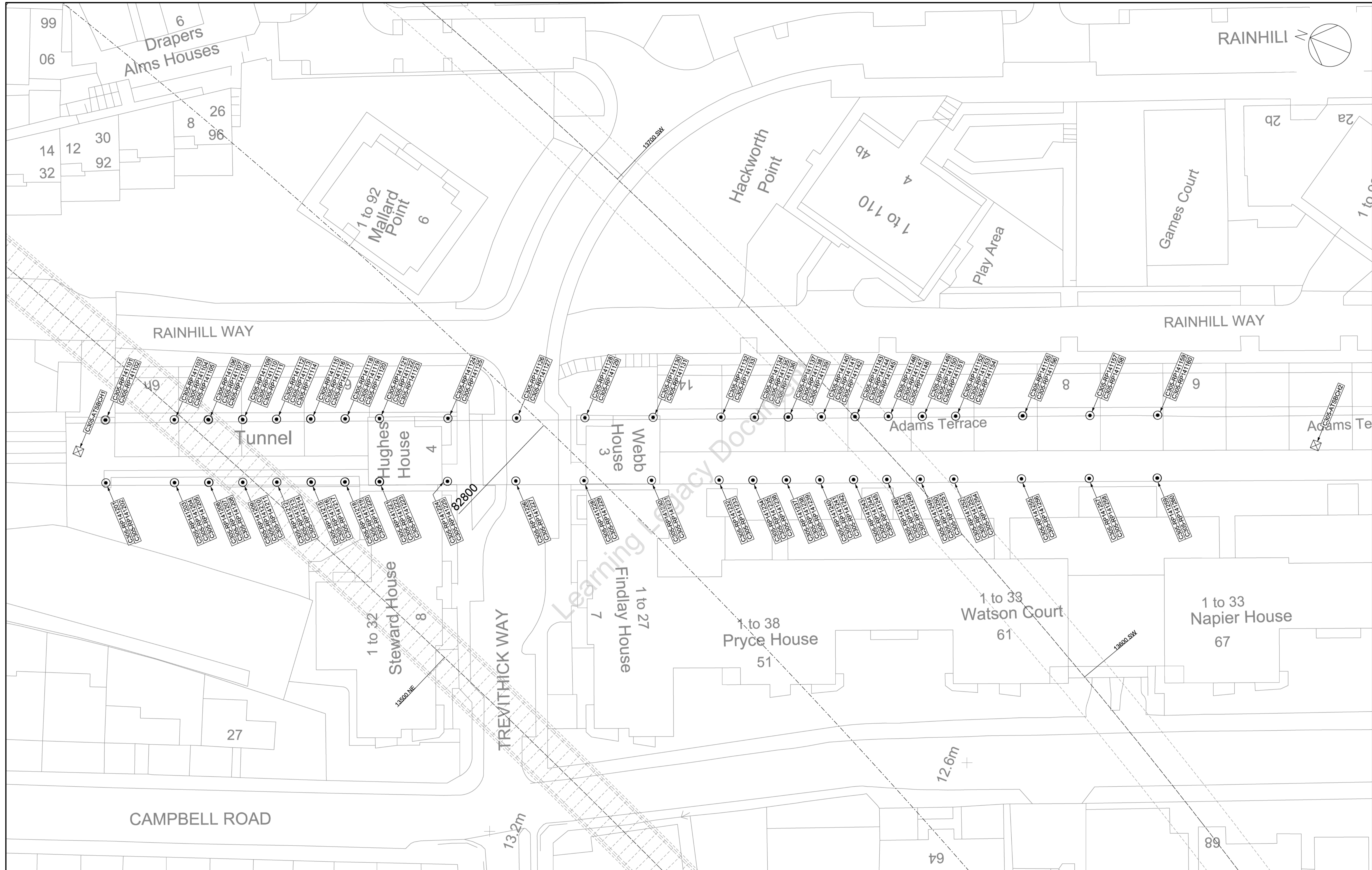
Apparently there is no movement due to EB TBM; settlement due to WB TBM is approx. 7mm. Settlement in the long term is approx. 9 mm.

**8. SUMMARY STATEMENT**

It has been agreed between the Project Manager, the Designer, the Contractor and the Sub Contractor that the instrumentation covered herein, for monitoring ground movement effects of Crossrail works, including long term effects, can be closed out for decommissioning a trends of the monitoring points were approaching or had achieved the specified 2 mm/year settlement rate.

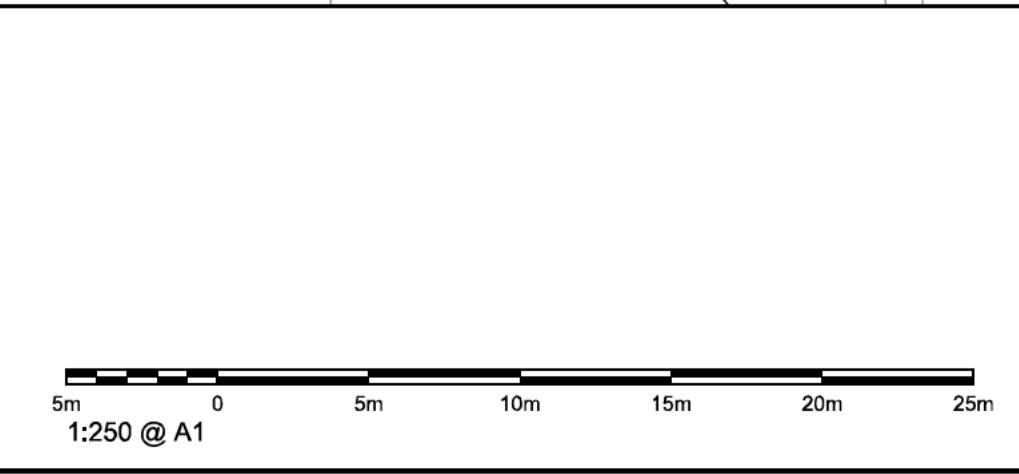
Learning Legacy Document


**APPENDIX A: INSTRUMENT LOCATION**



Rev.	Date	Description	By	Chkd	App	Auth
P01	01/02/2016	First Issue	MD	MD	MD	-
P02	04/02/2016	-	MD	MD	MD	-
P03	19/02/2016	-	MD	MD	MD	-

- Notes**
- 3D Prisms
  - ⊗ ATS





**Crossrail Limited**  
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Canary Wharf  
London  
E14 6LQ

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Contract: Tunnels East - Drive Y LIM to FAR & Drive Z SGJ to PML & Drive G  
 Originator: Dragados Sisk Joint Venture  
 Location: Crossrail Tunnels - Drive Z (Stepney Green to Pudding Mill Lane)

**Title:** Instrumentation & Monitoring  
 I&M Installation report for  
 ATS & 3D Prisms Bow Church Tunnel  
 C305-DSJ-C2-RGN-CRG03-50389

By: M.DAVIS  
 Chk: M.DAVIS  
 App: M.DAVIS  
 Auth: -

Scale: 1:250 @ A1  
 Drawing and CAD No: C305-DSJ-C2-DDA-CRT00\_ST007\_1-08171  
 Rev: P03  
 Suitability: S4

RESTRICTED

Learning Legacy Document

**APPENDIX B: SUMMARY OF INSTRUMENTATION INSTALLED ON SITE**

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
3D Prism	C305-RP141101	10-05-12	Installed	87812.409	37313.041	107.531	25-06-12	87812.409	37313.042	107.531
								87812.409	37313.041	107.531
								87812.409	37313.041	107.531
								87812.409	37313.041	107.530
3D Prism	C305-RP141102	10-05-12	Installed	87812.350	37313.148	112.133	25-06-12	87812.350	37313.148	112.133
								87812.350	37313.148	112.133
								87812.350	37313.149	112.133
								87812.351	37313.148	112.132
3D Prism	C305-RP141103	10-05-12	Installed	87816.160	37303.758	107.521	25-06-12	87816.160	37303.758	107.521
								87816.160	37303.758	107.521
								87816.160	37303.759	107.521
								87816.161	37303.758	107.520
3D Prism	C305-RP141104	10-05-12	Installed	87816.161	37303.738	109.858	25-06-12	87816.161	37303.738	109.858
								87816.161	37303.738	109.858
								87816.160	37303.738	109.858
								87816.161	37303.738	109.858
3D Prism	C305-RP141105	10-05-12	Installed	87816.152	37303.756	112.144	25-06-12	87816.152	37303.756	112.144
								87816.153	37303.756	112.144
								87816.152	37303.756	112.144
								87816.153	37303.756	112.143
3D Prism	C305-RP141106	10-05-12	Installed	87818.003	37299.185	107.559	25-06-12	87818.003	37299.185	107.559
								87818.004	37299.185	107.559
								87818.004	37299.185	107.559
								87818.004	37299.185	107.559
3D Prism	C305-RP141107	10-05-12	Installed	87818.015	37299.105	109.872	25-06-12	87818.015	37299.105	109.872
								87818.015	37299.105	109.872
								87818.015	37299.105	109.872

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87818.016	37299.105	109.872
3D Prism	C305-RP141108	10-05-12	Installed	87818.017	37299.066	112.137	25-06-12	87818.017	37299.066	112.137
								87818.017	37299.066	112.137
								87818.017	37299.066	112.137
								87818.017	37299.066	112.136
3D Prism	C305-RP141109	10-05-12	Installed	87819.905	37294.500	107.528	25-06-12	87819.905	37294.500	107.528
								87819.905	37294.500	107.528
								87819.905	37294.500	107.529
								87819.905	37294.499	107.528
3D Prism	C305-RP141110	10-05-12	Installed	87819.884	37294.465	109.878	25-06-12	87819.884	37294.465	109.878
								87819.884	37294.466	109.878
								87819.884	37294.466	109.878
								87819.884	37294.465	109.878
3D Prism	C305-RP141111	10-05-12	Installed	87819.879	37294.424	112.159	25-06-12	87819.879	37294.424	112.159
								87819.879	37294.424	112.158
								87819.879	37294.424	112.159
								87819.879	37294.424	112.158
3D Prism	C305-RP141112	10-05-12	Installed	87821.782	37289.873	107.559	25-06-12	87821.782	37289.873	107.559
								87821.782	37289.873	107.558
								87821.782	37289.874	107.559
								87821.782	37289.874	107.558
3D Prism	C305-RP141113	10-05-12	Installed	87821.777	37289.858	109.878	25-06-12	87821.777	37289.858	109.878
								87821.777	37289.859	109.877
								87821.777	37289.859	109.878
								87821.778	37289.859	109.877
3D Prism	C305-RP141114	10-05-12	Installed	87821.764	37289.892	112.158	25-06-12	87821.764	37289.892	112.158
								87821.764	37289.893	112.158
								87821.764	37289.893	112.158

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87821.764	37289.893	112.158
3D Prism	C305-RP141115	10-05-12	Installed	87823.673	37285.214	107.546	25-06-12	87823.673	37285.214	107.546
								87823.673	37285.214	107.547
								87823.672	37285.214	107.547
								87823.673	37285.214	107.547
3D Prism	C305-RP141116	10-05-12	Installed	87823.673	37285.225	109.902	25-06-12	87823.673	37285.225	109.902
								87823.673	37285.226	109.903
								87823.673	37285.226	109.903
								87823.673	37285.226	109.902
3D Prism	C305-RP141117	10-05-12	Installed	87823.651	37285.274	112.168	25-06-12	87823.651	37285.274	112.168
								87823.651	37285.275	112.168
								87823.651	37285.275	112.168
								87823.652	37285.275	112.168
3D Prism	C305-RP141118	10-05-12	Installed	87825.554	37280.558	107.483	25-06-12	87825.554	37280.558	107.483
								87825.554	37280.559	107.483
								87825.554	37280.559	107.484
								87825.554	37280.559	107.483
3D Prism	C305-RP141119	10-05-12	Installed	87825.558	37280.553	109.882	25-06-12	87825.558	37280.553	109.882
								87825.558	37280.554	109.881
								87825.558	37280.554	109.882
								87825.558	37280.554	109.882
3D Prism	C305-RP141120	10-05-12	Installed	87825.541	37280.602	112.161	25-06-12	87825.541	37280.602	112.161
								87825.541	37280.603	112.161
								87825.541	37280.603	112.161
								87825.542	37280.603	112.161
3D Prism	C305-RP141121	10-05-12	Installed	87827.431	37275.917	107.485	25-06-12	87827.431	37275.917	107.485
								87827.431	37275.917	107.485
								87827.431	37275.918	107.486

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87827.432	37275.917	107.485
3D Prism	C305-RP141122	10-05-12	Installed	87827.452	37275.916	109.892	25-06-12	87827.452	37275.916	109.892
								87827.452	37275.917	109.892
								87827.452	37275.917	109.892
								87827.452	37275.917	109.892
3D Prism	C305-RP141123	10-05-12	Installed	87827.462	37275.936	112.189	25-06-12	87827.462	37275.936	112.189
								87827.462	37275.936	112.189
								87827.462	37275.936	112.189
								87827.463	37275.936	112.189
3D Prism	C305-RP141124	10-05-12	Installed	87831.181	37266.639	107.483	25-06-12	87831.181	37266.639	107.483
								87831.181	37266.640	107.483
								87831.181	37266.640	107.483
								87831.182	37266.640	107.483
3D Prism	C305-RP141125	10-05-12	Installed	87831.195	37266.615	112.167	25-06-12	87831.195	37266.615	112.167
								87831.196	37266.616	112.167
								87831.196	37266.616	112.167
								87831.196	37266.615	112.167
3D Prism	C305-RP141126	10-05-12	Installed	87838.706	37248.050	107.544	25-06-12	87838.706	37248.050	107.544
								87838.706	37248.051	107.544
								87838.706	37248.051	107.544
								87838.706	37248.051	107.544
3D Prism	C305-RP141127	10-05-12	Installed	87834.954	37257.318	111.530	25-06-12	87834.954	37257.318	111.530
								87834.954	37257.319	111.529
								87834.954	37257.319	111.530
								87834.955	37257.319	111.529
3D Prism	C305-RP141128	10-05-12	Installed	87838.706	37248.050	107.544	25-06-12	87838.706	37248.050	107.544
								87838.706	37248.051	107.544
								87838.706	37248.051	107.544



**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87838.706	37248.051	107.544
3D Prism	C305-RP141129	10-05-12	Installed	87838.699	37248.035	111.529	25-06-12	87838.699	37248.035	111.529
								87838.699	37248.036	111.528
								87838.699	37248.036	111.528
								87838.699	37248.036	111.528
3D Prism	C305-RP141130	10-05-12	Installed	87842.451	37238.800	107.404	25-06-12	87842.451	37238.800	107.404
								87842.451	37238.801	107.404
								87842.451	37238.801	107.405
								87842.451	37238.801	107.404
3D Prism	C305-RP141131	10-05-12	Installed	87842.455	37238.783	111.517	25-06-12	87842.455	37238.783	111.517
								87842.455	37238.784	111.517
								87842.455	37238.784	111.517
								87842.455	37238.783	111.516
3D Prism	C305-RP141132	10-05-12	Installed	87846.168	37229.594	107.318	25-06-12	87846.168	37229.594	107.318
								87846.168	37229.595	107.318
								87846.168	37229.595	107.318
								87846.169	37229.594	107.318
3D Prism	C305-RP141133	10-05-12	Installed	87846.171	37229.583	111.519	25-06-12	87846.171	37229.583	111.519
								87846.171	37229.584	111.519
								87846.171	37229.585	111.517
								87846.171	37229.584	111.516
3D Prism	C305-RP141134	10-05-12	Installed	87847.969	37225.026	107.327	25-06-12	87847.969	37225.026	107.327
								87847.969	37225.025	107.327
								87847.970	37225.026	107.327
								87847.970	37225.026	107.327
3D Prism	C305-RP141135	10-05-12	Installed	87847.957	37225.025	109.868	25-06-12	87847.957	37225.025	109.868
								87847.958	37225.025	109.868
								87847.959	37225.025	109.868

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87847.958	37225.025	109.867
3D Prism	C305-RP141136	10-05-12	Installed	87847.959	37225.000	111.524	25-06-12	87847.959	37225.000	111.524
								87847.959	37224.999	111.524
								87847.959	37225.000	111.522
								87847.960	37225.000	111.522
3D Prism	C305-RP141137	10-05-12	Installed	87849.807	37220.475	107.338	25-06-12	87849.807	37220.475	107.338
								87849.807	37220.474	107.338
								87849.808	37220.474	107.338
								87849.808	37220.474	107.338
3D Prism	C305-RP141138	10-05-12	Installed	87849.824	37220.440	109.870	25-06-12	87849.824	37220.440	109.870
								87849.823	37220.440	109.870
								87849.825	37220.440	109.870
								87849.824	37220.440	109.870
3D Prism	C305-RP141139	10-05-12	Installed	87849.839	37220.412	111.533	25-06-12	87849.839	37220.412	111.533
								87849.839	37220.411	111.532
								87849.840	37220.412	111.532
								87849.840	37220.412	111.531
3D Prism	C305-RP141140	10-05-12	Installed	87851.653	37215.953	107.297	25-06-12	87851.653	37215.953	107.297
								87851.653	37215.952	107.297
								87851.654	37215.953	107.298
								87851.654	37215.953	107.297
3D Prism	C305-RP141141	10-05-12	Installed	87851.657	37215.960	109.851	25-06-12	87851.657	37215.960	109.851
								87851.657	37215.960	109.851
								87851.658	37215.960	109.851
								87851.658	37215.960	109.851
3D Prism	C305-RP141142	10-05-12	Installed	87851.663	37215.952	111.537	25-06-12	87851.663	37215.952	111.537
								87851.663	37215.951	111.537
								87851.664	37215.952	111.536

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87851.664	37215.952	111.535
3D Prism	C305-RP141143	10-05-12	Installed	87853.516	37211.364	107.260	25-06-12	87853.516	37211.364	107.260
								87853.516	37211.363	107.260
								87853.516	37211.364	107.260
								87853.516	37211.364	107.260
3D Prism	C305-RP141144	10-05-12	Installed	87853.515	37211.381	109.875	25-06-12	87853.515	37211.381	109.875
								87853.515	37211.380	109.875
								87853.515	37211.381	109.875
								87853.516	37211.381	109.875
3D Prism	C305-RP141145	10-05-12	Installed	87853.504	37211.414	111.536	25-06-12	87853.504	37211.414	111.536
								87853.505	37211.414	111.536
								87853.505	37211.414	111.535
								87853.505	37211.414	111.535
3D Prism	C305-RP141146	10-05-12	Installed	87855.342	37206.863	107.224	25-06-12	87855.342	37206.863	107.224
								87855.343	37206.862	107.224
								87855.343	37206.863	107.224
								87855.343	37206.863	107.224
3D Prism	C305-RP141147	10-05-12	Installed	87855.343	37206.880	109.874	25-06-12	87855.343	37206.880	109.874
								87855.344	37206.880	109.875
								87855.344	37206.880	109.874
								87855.344	37206.880	109.874
3D Prism	C305-RP141148	10-05-12	Installed	87855.349	37206.866	111.545	25-06-12	87855.349	37206.866	111.545
								87855.349	37206.865	111.546
								87855.349	37206.865	111.545
								87855.350	37206.865	111.544
3D Prism	C305-RP141149	10-05-12	Installed	87857.187	37202.286	107.269	25-06-12	87857.187	37202.286	107.269
								87857.187	37202.286	107.269
								87857.187	37202.286	107.269

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87857.187	37202.286	107.269
3D Prism	C305-RP141150	10-05-12	Installed	87857.202	37202.255	109.881	25-06-12	87857.202	37202.255	109.881
								87857.202	37202.255	109.881
								87857.203	37202.255	109.881
								87857.203	37202.255	109.881
3D Prism	C305-RP141151	10-05-12	Installed	87857.203	37202.243	111.532	25-06-12	87857.203	37202.243	111.532
								87857.203	37202.243	111.532
								87857.203	37202.243	111.531
								87857.203	37202.243	111.531
3D Prism	C305-RP141152	10-05-12	Installed	87859.023	37197.745	107.263	25-06-12	87859.023	37197.745	107.263
								87859.023	37197.745	107.263
								87859.024	37197.745	107.263
								87859.024	37197.745	107.263
3D Prism	C305-RP141153	10-05-12	Installed	87859.042	37197.725	109.873	25-06-12	87859.042	37197.725	109.873
								87859.042	37197.724	109.873
								87859.043	37197.725	109.872
								87859.043	37197.724	109.873
3D Prism	C305-RP141154	10-05-12	Installed	87859.039	37197.733	111.531	25-06-12	87859.039	37197.733	111.531
								87859.039	37197.733	111.531
								87859.039	37197.733	111.531
								87859.039	37197.733	111.530
3D Prism	C305-RP141155	10-05-12	Installed	87862.691	37188.688	107.424	25-06-12	87862.691	37188.688	107.424
								87862.691	37188.688	107.424
								87862.691	37188.688	107.424
								87862.691	37188.688	107.424
3D Prism	C305-RP141156	10-05-12	Installed	87862.734	37188.606	111.518	25-06-12	87862.734	37188.606	111.518
								87862.733	37188.606	111.518
								87862.734	37188.606	111.517

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87862.734	37188.606	111.517
3D Prism	C305-RP141157	10-05-12	Installed	87866.398	37179.520	107.302	25-06-12	87866.398	37179.520	107.302
								87866.398	37179.520	107.303
								87866.398	37179.520	107.303
								87866.398	37179.520	107.303
3D Prism	C305-RP141158	10-05-12	Installed	87866.419	37179.516	111.506	25-06-12	87866.419	37179.516	111.506
								87866.419	37179.516	111.506
								87866.419	37179.516	111.506
								87866.419	37179.516	111.506
3D Prism	C305-RP141159	10-05-12	Installed	87870.110	37170.347	107.247	25-06-12	87870.110	37170.347	107.247
								87870.110	37170.347	107.247
								87870.110	37170.346	107.247
								87870.110	37170.346	107.247
3D Prism	C305-RP141160	10-05-12	Installed	87870.136	37170.308	111.534	25-06-12	87870.136	37170.308	111.534
								87870.135	37170.308	111.534
								87870.136	37170.308	111.534
								87870.135	37170.308	111.534
3D Prism	C305-RP141201	10-05-12	Installed	87803.867	37309.618	107.514	25-06-12	87803.867	37309.618	107.514
								87803.867	37309.618	107.514
								87803.867	37309.618	107.514
								87803.867	37309.618	107.514
3D Prism	C305-RP141202	10-05-12	Installed	87803.870	37309.623	112.138	25-06-12	87803.870	37309.623	112.138
								87803.870	37309.623	112.138
								87803.870	37309.624	112.138
								87803.870	37309.623	112.138
3D Prism	C305-RP141203	10-05-12	Installed	87807.614	37300.330	107.452	25-06-12	87807.614	37300.330	107.452
								87807.614	37300.330	107.453
								87807.614	37300.331	107.452

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87807.615	37300.330	107.452
3D Prism	C305-RP141204	10-05-12	Installed	87807.613	37300.307	109.858	25-06-12	87807.613	37300.307	109.858
								87807.614	37300.307	109.858
								87807.613	37300.307	109.858
								87807.614	37300.307	109.858
3D Prism	C305-RP141205	10-05-12	Installed	87807.625	37300.286	112.144	25-06-12	87807.625	37300.286	112.144
								87807.626	37300.286	112.144
								87807.625	37300.287	112.144
								87807.626	37300.287	112.144
3D Prism	C305-RP141206	10-05-12	Installed	87809.497	37295.683	107.437	25-06-12	87809.497	37295.683	107.437
								87809.497	37295.683	107.437
								87809.497	37295.684	107.437
								87809.498	37295.683	107.437
3D Prism	C305-RP141207	10-05-12	Installed	87809.503	37295.657	109.856	25-06-12	87809.503	37295.657	109.856
								87809.503	37295.657	109.856
								87809.503	37295.657	109.856
								87809.503	37295.657	109.856
3D Prism	C305-RP141208	10-05-12	Installed	87809.531	37295.623	112.139	25-06-12	87809.531	37295.623	112.139
								87809.531	37295.624	112.139
								87809.531	37295.624	112.139
								87809.531	37295.623	112.138
3D Prism	C305-RP141209	10-05-12	Installed	87811.375	37291.055	107.433	25-06-12	87811.375	37291.055	107.433
								87811.376	37291.055	107.432
								87811.375	37291.055	107.433
								87811.376	37291.055	107.432
3D Prism	C305-RP141210	10-05-12	Installed	87811.357	37291.047	109.874	25-06-12	87811.357	37291.047	109.874
								87811.357	37291.047	109.874
								87811.357	37291.047	109.874

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87811.358	37291.047	109.874
3D Prism	C305-RP141211	10-05-12	Installed	87811.363	37291.028	112.123	25-06-12	87811.363	37291.028	112.123
								87811.364	37291.028	112.123
								87811.363	37291.028	112.123
								87811.364	37291.028	112.123
3D Prism	C305-RP141212	10-05-12	Installed	87813.251	37286.419	107.405	25-06-12	87813.251	37286.419	107.405
								87813.251	37286.419	107.406
								87813.250	37286.420	107.406
								87813.251	37286.419	107.405
3D Prism	C305-RP141213	10-05-12	Installed	87813.225	37286.436	109.888	25-06-12	87813.225	37286.436	109.888
								87813.225	37286.436	109.888
								87813.225	37286.436	109.888
								87813.225	37286.435	109.888
3D Prism	C305-RP141214	10-05-12	Installed	87813.242	37286.412	112.116	25-06-12	87813.242	37286.412	112.116
								87813.243	37286.412	112.116
								87813.243	37286.413	112.116
								87813.243	37286.412	112.116
3D Prism	C305-RP141215	10-05-12	Installed	87815.118	37281.801	107.390	25-06-12	87815.118	37281.801	107.390
								87815.118	37281.801	107.390
								87815.118	37281.801	107.390
								87815.118	37281.801	107.390
3D Prism	C305-RP141216	10-05-12	Installed	87815.093	37281.773	109.878	25-06-12	87815.093	37281.773	109.878
								87815.093	37281.773	109.878
								87815.093	37281.774	109.878
								87815.093	37281.773	109.878
3D Prism	C305-RP141217	10-05-12	Installed	87815.107	37281.734	112.114	25-06-12	87815.107	37281.734	112.114
								87815.107	37281.734	112.114
								87815.107	37281.734	112.114

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87815.107	37281.734	112.114
3D Prism	C305-RP141218	10-05-12	Installed	87816.985	37277.158	107.349	25-06-12	87816.985	37277.158	107.349
								87816.985	37277.158	107.349
								87816.985	37277.159	107.349
								87816.986	37277.158	107.348
3D Prism	C305-RP141219	10-05-12	Installed	87816.947	37277.162	109.863	25-06-12	87816.947	37277.162	109.863
								87816.948	37277.162	109.862
								87816.948	37277.163	109.863
								87816.948	37277.162	109.862
3D Prism	C305-RP141220	10-05-12	Installed	87816.936	37277.211	112.125	25-06-12	87816.936	37277.211	112.125
								87816.936	37277.211	112.125
								87816.936	37277.211	112.125
								87816.937	37277.211	112.125
3D Prism	C305-RP141221	10-05-12	Installed	87818.865	37272.543	107.330	25-06-12	87818.865	37272.543	107.330
								87818.866	37272.543	107.330
								87818.865	37272.543	107.330
								87818.866	37272.543	107.330
3D Prism	C305-RP141222	10-05-12	Installed	87818.859	37272.495	109.837	25-06-12	87818.859	37272.495	109.837
								87818.859	37272.495	109.837
								87818.859	37272.495	109.837
								87818.859	37272.495	109.837
3D Prism	C305-RP141223	10-05-12	Installed	87818.878	37272.458	112.120	25-06-12	87818.878	37272.458	112.120
								87818.878	37272.459	112.120
								87818.878	37272.459	112.120
								87818.878	37272.459	112.119
3D Prism	C305-RP141224	10-05-12	Installed	87822.603	37263.292	107.334	25-06-12	87822.603	37263.292	107.334
								87822.603	37263.292	107.334
								87822.603	37263.293	107.334



**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87822.604	37263.292	107.334
3D Prism	C305-RP141225	10-05-12	Installed	87822.612	37263.254	112.123	25-06-12	87822.612	37263.254	112.123
								87822.613	37263.255	112.123
								87822.613	37263.255	112.123
								87822.613	37263.255	112.122
3D Prism	C305-RP141226	10-05-12	Installed	87826.365	37254.004	107.288	25-06-12	87826.365	37254.004	107.288
								87826.365	37254.005	107.288
								87826.365	37254.005	107.288
								87826.366	37254.004	107.288
3D Prism	C305-RP141227	10-05-12	Installed	87826.352	37254.001	111.508	25-06-12	87826.352	37254.001	111.508
								87826.352	37254.002	111.508
								87826.353	37254.002	111.509
								87826.353	37254.002	111.508
3D Prism	C305-RP141228	10-05-12	Installed	87830.099	37244.757	107.329	25-06-12	87830.099	37244.757	107.329
								87830.099	37244.758	107.329
								87830.099	37244.758	107.329
								87830.100	37244.758	107.329
3D Prism	C305-RP141229	10-05-12	Installed	87830.093	37244.767	111.516	25-06-12	87830.093	37244.767	111.516
								87830.094	37244.768	111.515
								87830.094	37244.768	111.515
								87830.094	37244.767	111.515
3D Prism	C305-RP141230	10-05-12	Installed	87833.815	37235.588	107.198	25-06-12	87833.815	37235.588	107.198
								87833.815	37235.589	107.199
								87833.815	37235.589	107.198
								87833.815	37235.589	107.198
3D Prism	C305-RP141231	10-05-12	Installed	87833.805	37235.595	111.526	25-06-12	87833.805	37235.595	111.526
								87833.805	37235.596	111.526
								87833.805	37235.596	111.526

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87833.806	37235.596	111.525
3D Prism	C305-RP141232	10-05-12	Installed	87837.526	37226.421	107.234	25-06-12	87837.526	37226.421	107.234
								87837.526	37226.422	107.234
								87837.526	37226.422	107.234
								87837.527	37226.422	107.233
3D Prism	C305-RP141233	10-05-12	Installed	87837.512	37226.424	111.523	25-06-12	87837.512	37226.424	111.523
								87837.513	37226.425	111.523
								87837.512	37226.425	111.523
								87837.513	37226.425	111.520
3D Prism	C305-RP141234	10-05-12	Installed	87839.336	37221.797	111.526	25-06-12	87839.336	37221.797	111.526
								87839.337	37221.796	111.526
								87839.338	37221.797	111.525
								87839.338	37221.797	111.524
3D Prism	C305-RP141235	10-05-12	Installed	87839.345	37221.795	109.800	25-06-12	87839.345	37221.795	109.800
								87839.345	37221.795	109.799
								87839.346	37221.795	109.799
								87839.347	37221.796	109.799
3D Prism	C305-RP141236	10-05-12	Installed	87839.327	37221.846	107.179	25-06-12	87839.327	37221.846	107.179
								87839.328	37221.846	107.179
								87839.328	37221.846	107.179
								87839.329	37221.846	107.178
3D Prism	C305-RP141237	10-05-12	Installed	87841.172	37217.287	111.511	25-06-12	87841.172	37217.287	111.511
								87841.172	37217.286	111.510
								87841.173	37217.286	111.510
								87841.173	37217.286	111.510
3D Prism	C305-RP141238	10-05-12	Installed	87841.190	37217.261	109.786	25-06-12	87841.190	37217.261	109.786
								87841.191	37217.260	109.786
								87841.192	37217.261	109.786

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87841.192	37217.261	109.785
3D Prism	C305-RP141239	10-05-12	Installed	87841.178	37217.306	107.165	25-06-12	87841.178	37217.306	107.165
								87841.177	37217.306	107.164
								87841.173	37217.304	107.164
								87841.178	37217.306	107.165
3D Prism	C305-RP141240	10-05-12	Installed	87843.007	37212.743	111.524	25-06-12	87843.007	37212.743	111.524
								87843.008	37212.743	111.525
								87843.009	37212.743	111.524
								87843.009	37212.744	111.524
3D Prism	C305-RP141241	10-05-12	Installed	87843.011	37212.741	109.800	25-06-12	87843.011	37212.741	109.800
								87843.011	37212.741	109.801
								87843.012	37212.741	109.800
								87843.012	37212.741	109.800
3D Prism	C305-RP141242	10-05-12	Installed	87843.014	37212.753	107.228	25-06-12	87843.014	37212.753	107.228
								87843.014	37212.753	107.228
								87843.015	37212.753	107.228
								87843.015	37212.753	107.228
3D Prism	C305-RP141243	10-05-12	Installed	87844.878	37208.148	111.528	25-06-12	87844.878	37208.148	111.528
								87844.877	37208.147	111.528
								87844.878	37208.148	111.528
								87844.878	37208.148	111.527
3D Prism	C305-RP141244	10-05-12	Installed	87844.865	37208.183	109.827	25-06-12	87844.865	37208.183	109.827
								87844.865	37208.182	109.827
								87844.866	37208.183	109.827
								87844.866	37208.183	109.827
3D Prism	C305-RP141245	10-05-12	Installed	87844.868	37208.180	107.214	25-06-12	87844.868	37208.180	107.214
								87844.868	37208.180	107.214
								87844.868	37208.180	107.214

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87844.869	37208.180	107.214
3D Prism	C305-RP141246	10-05-12	Installed	87846.708	37203.661	111.519	25-06-12	87846.708	37203.661	111.519
								87846.708	37203.661	111.519
								87846.709	37203.661	111.519
								87846.709	37203.661	111.519
3D Prism	C305-RP141247	10-05-12	Installed	87846.699	37203.668	109.777	25-06-12	87846.699	37203.668	109.777
								87846.699	37203.668	109.777
								87846.700	37203.668	109.777
								87846.700	37203.668	109.777
3D Prism	C305-RP141248	10-05-12	Installed	87846.703	37203.649	107.198	25-06-12	87846.703	37203.649	107.198
								87846.703	37203.648	107.198
								87846.704	37203.649	107.198
								87846.704	37203.649	107.198
3D Prism	C305-RP141249	10-05-12	Installed	87848.543	37199.122	111.524	25-06-12	87848.543	37199.122	111.524
								87848.543	37199.121	111.524
								87848.543	37199.122	111.524
								87848.543	37199.122	111.524
3D Prism	C305-RP141250	10-05-12	Installed	87848.536	37199.128	109.797	25-06-12	87848.536	37199.128	109.797
								87848.536	37199.127	109.797
								87848.537	37199.128	109.797
								87848.537	37199.128	109.797
3D Prism	C305-RP141251	10-05-12	Installed	87848.539	37199.116	107.156	25-06-12	87848.539	37199.116	107.156
								87848.539	37199.117	107.157
								87848.539	37199.117	107.156
								87848.540	37199.117	107.156
3D Prism	C305-RP141252	10-05-12	Installed	87850.368	37194.568	111.517	25-06-12	87850.368	37194.568	111.517
								87850.368	37194.568	111.517
								87850.369	37194.568	111.517

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87850.369	37194.568	111.517
3D Prism	C305-RP141253	10-05-12	Installed	87850.370	37194.581	109.783	25-06-12	87850.370	37194.581	109.783
								87850.370	37194.580	109.783
								87850.371	37194.581	109.783
								87850.371	37194.581	109.783
3D Prism	C305-RP141254	10-05-12	Installed	87850.375	37194.574	107.162	25-06-12	87850.375	37194.574	107.162
								87850.375	37194.574	107.162
								87850.376	37194.574	107.163
								87850.376	37194.574	107.163
3D Prism	C305-RP141255	10-05-12	Installed	87854.083	37185.373	111.523	25-06-12	87854.083	37185.373	111.523
								87854.084	37185.372	111.523
								87854.084	37185.373	111.523
								87854.084	37185.373	111.522
3D Prism	C305-RP141256	10-05-12	Installed	87854.090	37185.394	107.186	25-06-12	87854.090	37185.394	107.186
								87854.090	37185.394	107.186
								87854.090	37185.394	107.186
								87854.090	37185.394	107.186
3D Prism	C305-RP141257	10-05-12	Installed	87857.799	37176.221	111.497	25-06-12	87857.799	37176.221	111.497
								87857.799	37176.221	111.497
								87857.800	37176.221	111.497
								87857.800	37176.221	111.496
3D Prism	C305-RP141258	10-05-12	Installed	87857.823	37176.187	107.125	25-06-12	87857.823	37176.187	107.125
								87857.824	37176.186	107.125
								87857.824	37176.187	107.125
								87857.824	37176.187	107.125
3D Prism	C305-RP141259	10-05-12	Installed	87861.568	37166.944	111.513	25-06-12	87861.568	37166.944	111.513
								87861.568	37166.944	111.513
								87861.568	37166.944	111.513

**IRS Installation Record Sheets – 3D Prism**

Sensor Type	Sensor ID	Date Installation	Status	Sensor Location - GPS Reading			Commissioning Readings (m)			
				Eastings X (m)	Northings Y (m)	Elevation Z (mATD)	Average	Eastings X (m)	Northings Y (m)	Elevation Z (mATD)
								87861.568	37166.944	111.513
3D Prism	C305-RP141260	10-05-12	Installed	87861.547	37167.009	107.101	25-06-12	87861.547	37167.009	107.101
								87861.547	37167.009	107.101
								87861.548	37167.009	107.101
								87861.547	37167.009	107.101

*Note: All elevations or levels presented in this document are metres above tunnel datum (mATD).*

Learning Legacy Document

**Instrumentation summary –Track levelling NORTHBOUND CESS**

The first levelling track point C305-LT141101, is located approximately 50 meters North of C305 EB tunnel centre line . All other points follow southwards at 3m centre.

Sensor Type	Sensor ID	SENSOR Location - GPS reading (m)		
		Eastings X	Northings Y	Elevation Z (mATD)
Levelling point	C305-LT141101	87794.699	37339.909	104.959
Levelling point	C305-LT141102	87795.859	37337.107	104.951
Levelling point	C305-LT141103	87796.99	37334.33	104.952
Levelling point	C305-LT141104	87798.121	37331.56	104.951
Levelling point	C305-LT141105	87799.246	37328.78	104.943
Levelling point	C305-LT141106	87800.359	37326.027	104.942
Levelling point	C305-LT141107	87801.492	37323.246	104.933
Levelling point	C305-LT141108	87802.599	37320.507	104.926
Levelling point	C305-LT141109	87803.717	37317.734	104.917
Levelling point	C305-LT141110	87804.821	37314.996	104.923
Levelling point	C305-LT141111	87805.966	37312.179	104.908
Levelling point	C305-LT141112	87807.104	37309.367	104.901
Levelling point	C305-LT141113	87798.344	37327.7878	104.885
Levelling point	C305-LT141114	87809.335	37303.857	104.870
Levelling point	C305-LT141115	87810.454	37301.118	104.859
Levelling point	C305-LT141116	87811.581	37298.317	104.849
Levelling point	C305-LT141117	87812.7100	37295.5320	104.839
Levelling point	C305-LT141118	87813.805	37292.833	104.828
Levelling point	C305-LT141119	87814.939	37290.038	104.815
Levelling point	C305-LT141120	87816.054	37287.287	104.802
Levelling point	C305-LT141121	87817.178	37284.494	104.791
Levelling point	C305-LT141122	87818.306	37281.717	104.779
Levelling point	C305-LT141123	87819.41	37278.991	104.769
Levelling point	C305-LT141124	87820.52	37276.231	104.758
Levelling point	C305-LT141125	87821.643	37273.444	104.749
Levelling point	C305-LT141126	87822.773	37270.694	104.740
Levelling point	C305-LT141127	87823.886	37267.923	104.732
Levelling point	C305-LT141128	87824.997	37265.165	104.722
Levelling point	C305-LT141129	87826.116	37262.401	104.714
Levelling point	C305-LT141130	87827.243	37259.642	104.706
Levelling point	C305-LT141131	87828.35	37256.877	104.697
Levelling point	C305-LT141132	87829.479	37254.101	104.690
Levelling point	C305-LT141133	87830.584	37251.353	104.684
Levelling point	C305-LT141134	87831.711	37248.586	104.679
Levelling point	C305-LT141135	87832.831	37245.802	104.671
Levelling point	C305-LT141136	87833.897	37242.998	104.660
Levelling point	C305-LT141137	87835.012	37240.212	104.653
Levelling point	C305-LT141138	87836.133	37237.429	104.646
Levelling point	C305-LT141139	87837.26	37234.649	104.639
Levelling point	C305-LT141140	87838.389	37231.869	104.631
Levelling point	C305-LT141141	87839.51	37229.085	104.625
Levelling point	C305-LT141142	87840.634	37226.304	104.620
Levelling point	C305-LT141143	87841.754	37223.52	104.614
Levelling point	C305-LT141144	87842.882	37220.739	104.611
Levelling point	C305-LT141145	87843.998	37217.955	104.606
Levelling point	C305-LT141146	87845.12	37215.172	104.604
Levelling point	C305-LT141147	87846.25	37212.392	104.603
Levelling point	C305-LT141148	87847.376	37209.611	104.601
Levelling point	C305-LT141149	87848.4990	37206.8290	104.596
Levelling point	C305-LT141150	87849.627	37204.048	104.593
Levelling point	C305-LT141151	87850.764	37201.271	104.588
Levelling point	C305-LT141152	87851.874	37198.484	104.582
Levelling point	C305-LT141153	87853.001	37195.703	104.582
Levelling point	C305-LT141154	87854.125	37192.921	104.578
Levelling point	C305-LT141155	87855.252	37190.14	104.575
Levelling point	C305-LT141156	87856.376	37187.359	104.573
Levelling point	C305-LT141157	87857.497	37184.576	104.570
Levelling point	C305-LT141158	87858.624	37181.795	104.569
Levelling point	C305-LT141159	87859.753	37179.015	104.566
Levelling point	C305-LT141160	87860.876	37176.232	104.562
Levelling point	C305-LT141161	87862.003	37173.451	104.558
Levelling point	C305-LT141162	87863.128	37170.67	104.553
Levelling point	C305-LT141163	87864.249	37167.887	104.550
Levelling point	C305-LT141164	87865.377	37165.106	104.550
Levelling point	C305-LT141165	87866.507	37162.327	104.547
Levelling point	C305-LT141166	87867.6250	37159.5430	104.545
Levelling point	C305-LT141167	87868.746	37156.76	104.541
Levelling point	C305-LT141168	87869.879	37153.981	104.539
Levelling point	C305-LT141169	87871	37151.198	104.536
Levelling point	C305-LT141170	87872.12	37148.415	104.535
Levelling point	C305-LT141171	87873.2490	37145.6340	104.534

**Instrumentation summary –Track levelling NORTHBOUND 6FT**

The first levelling track point C305-LT141201, is located approximately 50 meters North of C305 EB tunnel centre line . All other points follow southwards at 3m centre.

Sensor Type	Sensor ID	SENSOR Location - GPS reading (m)		
		Eastings X	Northings Y	Elevation Z (mATD)
Levelling point	C305-LT141201	87796.061	37340.547	104.958
Levelling point	C305-LT141202	87797.235	37337.702	104.945
Levelling point	C305-LT141203	87798.387	37334.912	104.949
Levelling point	C305-LT141204	87799.501	37332.136	104.946
Levelling point	C305-LT141205	87800.622	37329.401	104.941
Levelling point	C305-LT141206	87801.754	37326.573	104.939
Levelling point	C305-LT141207	87802.848	37323.873	104.936
Levelling point	C305-LT141208	87803.95	37321.177	104.927
Levelling point	C305-LT141209	87805.077	37318.343	104.916
Levelling point	C305-LT141210	87806.209	37315.573	104.921
Levelling point	C305-LT141211	87807.331	37312.791	104.904
Levelling point	C305-LT141212	87808.496	37309.912	104.901
Levelling point	C305-LT141213	87809.605	37307.186	104.886
Levelling point	C305-LT141214	87810.706	37304.461	104.869
Levelling point	C305-LT141215	87811.829	37301.681	104.858
Levelling point	C305-LT141216	87812.945	37298.936	104.850
Levelling point	C305-LT141217	87814.0590	37296.1450	104.840
Levelling point	C305-LT141218	87804.8177	37314.2198	104.829
Levelling point	C305-LT141219	87816.297	37290.638	104.816
Levelling point	C305-LT141220	87817.407	37287.877	104.803
Levelling point	C305-LT141221	87818.545	37285.072	104.792
Levelling point	C305-LT141222	87819.676	37282.286	104.780
Levelling point	C305-LT141223	87820.75	37279.639	104.770
Levelling point	C305-LT141224	87821.898	37276.764	104.760
Levelling point	C305-LT141225	87823.025	37274.025	104.751
Levelling point	C305-LT141226	87824.142	37271.277	104.742
Levelling point	C305-LT141227	87825.261	37268.5	104.735
Levelling point	C305-LT141228	87826.381	37265.715	104.726
Levelling point	C305-LT141229	87827.502	37262.953	104.719
Levelling point	C305-LT141230	87828.599	37260.247	104.712
Levelling point	C305-LT141231	87829.749	37257.406	104.702
Levelling point	C305-LT141232	87830.865	37254.659	104.692
Levelling point	C305-LT141233	87831.96	37251.929	104.686
Levelling point	C305-LT141234	87833.09	37249.142	104.682
Levelling point	C305-LT141235	87834.212	37246.333	104.674
Levelling point	C305-LT141236	87835.287	37243.532	104.661
Levelling point	C305-LT141237	87836.403	37240.747	104.655
Levelling point	C305-LT141238	87837.524	37237.964	104.650
Levelling point	C305-LT141239	87838.651	37235.183	104.642
Levelling point	C305-LT141240	87839.78	37232.403	104.632
Levelling point	C305-LT141241	87840.901	37229.62	104.625
Levelling point	C305-LT141242	87842.025	37226.838	104.624
Levelling point	C305-LT141243	87843.145	37224.055	104.619
Levelling point	C305-LT141244	87844.273	37221.274	104.616
Levelling point	C305-LT141245	87845.389	37218.489	104.613
Levelling point	C305-LT141246	87846.511	37215.707	104.611
Levelling point	C305-LT141247	87847.641	37212.927	104.610
Levelling point	C305-LT141248	87848.767	37210.146	104.608
Levelling point	C305-LT141249	87849.8900	37207.3640	104.603
Levelling point	C305-LT141250	87851.018	37204.583	104.599
Levelling point	C305-LT141251	87852.143	37201.802	104.596
Levelling point	C305-LT141252	87853.265	37199.019	104.592
Levelling point	C305-LT141253	87854.392	37196.238	104.594
Levelling point	C305-LT141254	87855.515	37193.456	104.587
Levelling point	C305-LT141255	87856.643	37190.675	104.582
Levelling point	C305-LT141256	87857.767	37187.893	104.580
Levelling point	C305-LT141257	87858.888	37185.11	104.577
Levelling point	C305-LT141258	87860.015	37182.329	104.576
Levelling point	C305-LT141259	87861.144	37179.55	104.572
Levelling point	C305-LT141260	87862.267	37176.767	104.568
Levelling point	C305-LT141261	87863.394	37173.986	104.566
Levelling point	C305-LT141262	87864.519	37171.205	104.560
Levelling point	C305-LT141263	87865.64	37168.422	104.557
Levelling point	C305-LT141264	87866.768	37165.641	104.558
Levelling point	C305-LT141265	87867.898	37162.862	104.558
Levelling point	C305-LT141266	87869.0160	37160.0770	104.555
Levelling point	C305-LT141267	87870.137	37157.294	104.550
Levelling point	C305-LT141268	87871.27	37154.516	104.548
Levelling point	C305-LT141269	87872.391	37151.733	104.536
Levelling point	C305-LT141270	87873.511	37148.949	104.535
Levelling point	C305-LT141271	87874.6400	37146.1690	104.534

All elevations or levels presented in this document are metres above tunnel datum (mATD).



## GEOCISA UK

### Instrumentation summary –Track levelling SOUTHBOUND CESS

The first levelling track point C305-LT141301, is located approximately 50 meters North of C305 EB tunnel centre line . All other points follow southwards at 3m centre.

Sensor Type	Sensor ID	SENSOR Location - GPS reading (m)		
		Eastings X	Northings Y	Elevation Z (mATD)
Levelling point	C305-LT141301	87797.687	37341.084	104.976
Levelling point	C305-LT141302	87798.854	37338.251	104.971
Levelling point	C305-LT141303	87799.964	37335.531	104.967
Levelling point	C305-LT141304	87801.098	37332.737	104.960
Levelling point	C305-LT141305	87802.232	37329.956	104.953
Levelling point	C305-LT141306	87803.339	37327.198	104.943
Levelling point	C305-LT141307	87804.487	37324.382	104.940
Levelling point	C305-LT141308	87795.1225	37342.6496	104.931
Levelling point	C305-LT141309	87806.695	37318.91	104.926
Levelling point	C305-LT141310	87807.723	37316.366	104.917
Levelling point	C305-LT141311	87808.987	37313.26	104.905
Levelling point	C305-LT141312	87810.083	37310.508	104.888
Levelling point	C305-LT141313	87811.125	37307.951	104.878
Levelling point	C305-LT141314	87812.321	37304.997	104.861
Levelling point	C305-LT141315	87813.47	37302.176	104.855
Levelling point	C305-LT141316	87814.603	37299.373	104.841
Levelling point	C305-LT141317	87815.7270	37296.6030	104.834
Levelling point	C305-LT141318	87816.874	37293.774	104.823
Levelling point	C305-LT141319	87817.985	37291.003	104.812
Levelling point	C305-LT141320	87819.106	37288.228	104.803
Levelling point	C305-LT141321	87820.251	37285.403	104.793
Levelling point	C305-LT141322	87821.375	37282.637	104.784
Levelling point	C305-LT141323	87822.492	37279.863	104.773
Levelling point	C305-LT141324	87823.628	37277.069	104.764
Levelling point	C305-LT141325	87824.76	37274.299	104.756
Levelling point	C305-LT141326	87825.88	37271.5	104.745
Levelling point	C305-LT141327	87827.028	37268.663	104.732
Levelling point	C305-LT141328	87828.111	37265.981	104.723
Levelling point	C305-LT141329	87829.348	37262.937	104.716
Levelling point	C305-LT141330	87830.39	37260.38	104.708
Levelling point	C305-LT141331	87831.513	37257.591	104.699
Levelling point	C305-LT141332	87832.65	37254.768	104.689
Levelling point	C305-LT141333	87833.784	37251.977	104.678
Levelling point	C305-LT141334	87834.896	37249.222	104.669
Levelling point	C305-LT141335	87835.976	37246.536	104.659
Levelling point	C305-LT141336	87837.053	37243.693	104.649
Levelling point	C305-LT141337	87838.182	37240.904	104.640
Levelling point	C305-LT141338	87839.294	37238.141	104.632
Levelling point	C305-LT141339	87840.431	37235.34	104.625
Levelling point	C305-LT141340	87841.571	37232.533	104.619
Levelling point	C305-LT141341	87842.684	37229.764	104.613
Levelling point	C305-LT141342	87843.8	37227.006	104.605
Levelling point	C305-LT141343	87844.936	37224.179	104.597
Levelling point	C305-LT141344	87846.056	37221.423	104.591
Levelling point	C305-LT141345	87847.181	37218.607	104.587
Levelling point	C305-LT141346	87848.303	37215.832	104.584
Levelling point	C305-LT141347	87849.429	37213.063	104.581
Levelling point	C305-LT141348	87850.559	37210.27	104.577
Levelling point	C305-LT141349	87851.6880	37207.4720	104.574
Levelling point	C305-LT141350	87852.817	37204.693	104.570
Levelling point	C305-LT141351	87853.934	37201.928	104.564
Levelling point	C305-LT141352	87855.067	37199.118	104.560
Levelling point	C305-LT141353	87856.186	37196.358	104.557
Levelling point	C305-LT141354	87857.316	37193.558	104.558
Levelling point	C305-LT141355	87858.438	37190.793	104.556
Levelling point	C305-LT141356	87859.556	37188.024	104.553
Levelling point	C305-LT141357	87860.696	37185.194	104.549
Levelling point	C305-LT141358	87861.813	37182.439	104.548
Levelling point	C305-LT141359	87862.945	37179.655	104.545
Levelling point	C305-LT141360	87864.057	37176.893	104.542
Levelling point	C305-LT141361	87865.179	37174.129	104.539
Levelling point	C305-LT141362	87866.318	37171.311	104.535
Levelling point	C305-LT141363	87867.428	37168.553	104.532
Levelling point	C305-LT141364	87868.561	37165.765	104.529
Levelling point	C305-LT141365	87869.688	37162.995	104.525
Levelling point	C305-LT141366	87870.8210	37160.1640	104.523
Levelling point	C305-LT141367	87871.938	37157.395	104.520
Levelling point	C305-LT141368	87873.052	37154.669	104.520
Levelling point	C305-LT141369	87874.183	37151.852	104.520
Levelling point	C305-LT141370	87875.309	37149.058	104.517
Levelling point	C305-LT141371	87876.4430	37146.2690	104.513

All elevations or levels presented in this document are metres above tunnel datum (mATD).

**Instrumentation summary –Track levelling SOUTHBOUND 6Ft**

The first levelling track point C305-LT141401, is located approximately 50 meters North of C305 EB tunnel centre line . All other points follow southwards at 3m centre.

Sensor Type	Sensor ID	SENSOR Location - GPS reading (m)		
		Eastings X	Northings Y	Elevation Z (mATD)
Levelling point	C305-LT141401	87799.074	37341.607	104.976
Levelling point	C305-LT141402	87800.222	37338.838	104.971
Levelling point	C305-LT141403	87801.361	37336.094	104.965
Levelling point	C305-LT141404	87802.492	37333.311	104.958
Levelling point	C305-LT141405	87803.622	37330.527	104.951
Levelling point	C305-LT141406	87804.716	37327.793	104.938
Levelling point	C305-LT141407	87805.847	37325.027	104.942
Levelling point	C305-LT141408	87806.967	37322.253	104.931
Levelling point	C305-LT141409	87808.107	37319.432	104.927
Levelling point	C305-LT141410	87809.14	37316.877	104.916
Levelling point	C305-LT141411	87810.38	37313.859	104.903
Levelling point	C305-LT141412	87811.504	37311.045	104.882
Levelling point	C305-LT141413	87812.532	37308.476	104.876
Levelling point	C305-LT141414	87813.615	37305.796	104.858
Levelling point	C305-LT141415	87814.875	37302.686	104.854
Levelling point	C305-LT141416	87816.009	37299.901	104.841
Levelling point	C305-LT141417	87817.1260	37297.1400	104.834
Levelling point	C305-LT141418	87818.26	37294.332	104.821
Levelling point	C305-LT141419	87819.399	37291.518	104.808
Levelling point	C305-LT141420	87820.512	37288.742	104.800
Levelling point	C305-LT141421	87821.648	37285.969	104.791
Levelling point	C305-LT141422	87822.771	37283.173	104.782
Levelling point	C305-LT141423	87823.894	37280.408	104.771
Levelling point	C305-LT141424	87825.005	37277.645	104.759
Levelling point	C305-LT141425	87826.137	37274.859	104.753
Levelling point	C305-LT141426	87827.262	37272.065	104.742
Levelling point	C305-LT141427	87828.429	37269.186	104.730
Levelling point	C305-LT141428	87829.497	37266.532	104.721
Levelling point	C305-LT141429	87830.727	37263.501	104.717
Levelling point	C305-LT141430	87831.775	37260.935	104.708
Levelling point	C305-LT141431	87832.887	37258.161	104.698
Levelling point	C305-LT141432	87834.013	37255.391	104.688
Levelling point	C305-LT141433	87835.143	37252.599	104.679
Levelling point	C305-LT141434	87836.262	37249.835	104.668
Levelling point	C305-LT141435	87837.38	37247.066	104.658
Levelling point	C305-LT141436	87838.436	37244.232	104.649
Levelling point	C305-LT141437	87839.554	37241.466	104.638
Levelling point	C305-LT141438	87840.684	37238.676	104.631
Levelling point	C305-LT141439	87841.808	37235.89	104.624
Levelling point	C305-LT141440	87842.924	37233.109	104.618
Levelling point	C305-LT141441	87844.061	37230.318	104.611
Levelling point	C305-LT141442	87845.189	37227.544	104.604
Levelling point	C305-LT141443	87846.31	37224.749	104.596
Levelling point	C305-LT141444	87847.439	37221.964	104.590
Levelling point	C305-LT141445	87848.564	37219.175	104.585
Levelling point	C305-LT141446	87849.683	37216.408	104.582
Levelling point	C305-LT141447	87850.801	37213.628	104.577
Levelling point	C305-LT141448	87851.939	37210.83	104.574
Levelling point	C305-LT141449	87841.5164	37228.7303	104.573
Levelling point	C305-LT141450	87854.188	37205.259	104.568
Levelling point	C305-LT141451	87855.309	37202.505	104.562
Levelling point	C305-LT141452	87856.444	37199.695	104.557
Levelling point	C305-LT141453	87857.564	37196.915	104.554
Levelling point	C305-LT141454	87858.693	37194.128	104.555
Levelling point	C305-LT141455	87859.815	37191.359	104.553
Levelling point	C305-LT141456	87860.94	37188.568	104.551
Levelling point	C305-LT141457	87862.058	37185.798	104.546
Levelling point	C305-LT141458	87863.191	37182.999	104.545
Levelling point	C305-LT141459	87864.312	37180.221	104.542
Levelling point	C305-LT141460	87865.439	37177.446	104.541
Levelling point	C305-LT141461	87866.561	37174.662	104.537
Levelling point	C305-LT141462	87855.932	37192.4923	104.532
Levelling point	C305-LT141463	87868.817	37169.103	104.528
Levelling point	C305-LT141464	87869.943	37166.312	104.527
Levelling point	C305-LT141465	87871.078	37163.515	104.522
Levelling point	C305-LT141466	87872.1960	37160.7460	104.521
Levelling point	C305-LT141467	87873.318	37157.976	104.517
Levelling point	C305-LT141468	87874.443	37155.184	104.518
Levelling point	C305-LT141469	87875.57	37152.404	104.518
Levelling point	C305-LT141470	87876.697	37149.618	104.515
Levelling point	C305-LT141471	87877.8310	37146.8250	104.510

All elevations or levels presented in this document are metres above tunnel datum (mATD).

**APPENDIX C: CORRIGENDUM TO BASELINE REPORT**

Learning Legacy Document

**Corrigendum to Baseline Report no. C305-DSJ-C2-RGN-CRG03-50133**

1. Appendix B – Track Data, page 7

Top left graph (LT141101-LT141171):

The graph title “Northbound Inside Rail – Track Data” to be replaced with “Northbound Outside Rail – Track Data”

2. Appendix B – Track Data, page 7

Bottom left graph (LT141201-LT141271):

The graph title “Northbound Outside Rail – Track Data” to be replaced with “Northbound Inside Rail – Track Data”

3. Appendix B – Track Data, page 8

Top left graph (LT141101-LT141171):

The graph title “Northbound Inside Rail – Track Data” to be replaced with “Northbound Outside Rail – Track Data”

4. Appendix B – Track Data, page 8

Bottom left graph (LT141201-LT141271):

The graph title “Northbound Outside Rail – Track Data” to be replaced with “Northbound Inside Rail – Track Data”

Learning Legacy Document