



C300/410
Western Tunnels & Caverns Project

Paddington Throat Monitoring Network De-commissioning
Report

CRL Document Number: C300-BFK-C4-RGN-CRT00_ST005-50695
Contract MDL reference C14.020

1. Contractor Document Submittal History:

Revision:	Date:	Prepared by:	Checked by:	Approved by:	Reason for Issue:
1.0	03/04/2013	[Redacted]	[Redacted]	[Redacted]	For CRL Acceptance
		[Redacted]	[Redacted]	[Redacted]	

2a. Stakeholder (~~EU/NWR/DER/FRL/Other*~~ (delete* as applicable)) review required? YES NO
(If NO, strike out sections 2a & 2b and go to section 3)

This document has been reviewed by [Redacted] in the capacity of MR. PFE for coordination, compliance, integration, and acceptance as a safe system of work, output, control, sequence. This document is acceptable for transmittal to N12 (for info) for no objection to the works being executed as described.

Sign: [Redacted] Name: [Redacted] Date: 15/4/13

2b. Review by Stakeholder (if required):

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

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Reviewed/Accepted by:(signature)	Print Name:	Position:	Date:
[Redacted]	[Redacted]	<u>PFE</u>	<u>28.05.13</u>
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1 Introduction

Monitoring network consisting of 6 Automated Total Stations (ATS TA, TB, TC, TD, E and F) and a number of prisms along Network Rail lines 1, 3 and 6 and London Underground H&C line was implemented to monitor the ground movements related to Crossrail tunnelling works at Paddington Throat area.

Full account of installed instrumentation can be found in the following Installation Report:

Paddington ATS Installation Report: C300-BFK-C4-RGN-CRT00_ST005-50518-Rev 1.0

2 Operation

The Automated Total Stations were installed in mid-June of year 2012 (13/06/2012 – 18/06/2012) and the network started operating and taking regular hourly prism readings in September. On 13/11/2012 Network Rail issued LONO for Tunnel Boring Machine 2 to pass under the Paddington Throat area. TBM 2 passed out of the boundaries of Paddington Throat area on 25/11/2012.

3 Data

The data shows settlement of the ground in the area starting immediately after the TBM 2 passed the area, with the settlement rate decreasing rapidly about two weeks after the tunnelling works. It is, also, seen that lines 1 and 3 were affected the most, while line 6 shows almost no evidence of ground settlement after the TBM 2 passage. The data does not show any signs for potential residual risks, so this is not expected. The graphical representation of ground settlement monitoring data can be found in the Appendix A of this report.

4 De-commissioning

The ATSS continued to take hourly prism reading for two months after the TBM 2 has passed the area until it was clear that the ground settlement has reached acceptable limits. The ATSS were switched off on 24/01/2013 and automated monitoring was replaced with monthly track shoe monitoring as specified in the Combined I & M Instrument & Monitor Schedule C300 (ref no. C122-OVE-C2-DDJ-CR001_Z-30002).

ATSS TA and TB were removed shortly after they were switched off and ATSS TC and TD are to be removed in the nearest future. ATSS E and F were incorporated into the Paddington Station monitoring network.

5 Cross Passage Monitoring

Although the majority of instrumentation in the Throat area is, or shortly will be, removed- some of the brackets, data logging equipment, power installations and etc. will remain in place for the Cross Passage monitoring network. It is anticipated that ATSS TB and TC will provide sufficient cover for the required area for Cross Passage works, but the brackets and equipment of other ATSSs will remain in place until the monitoring system is fully agreed upon.

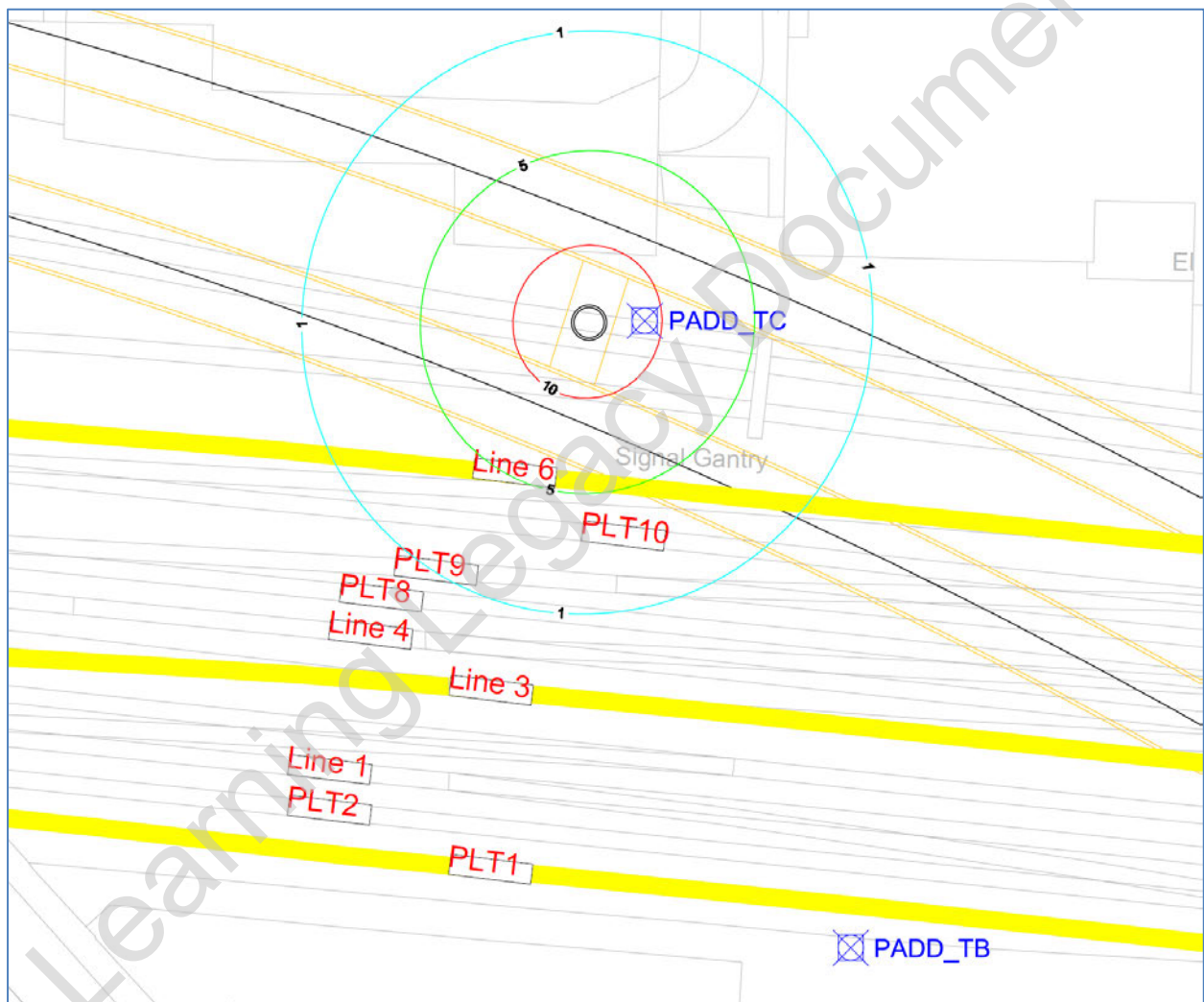
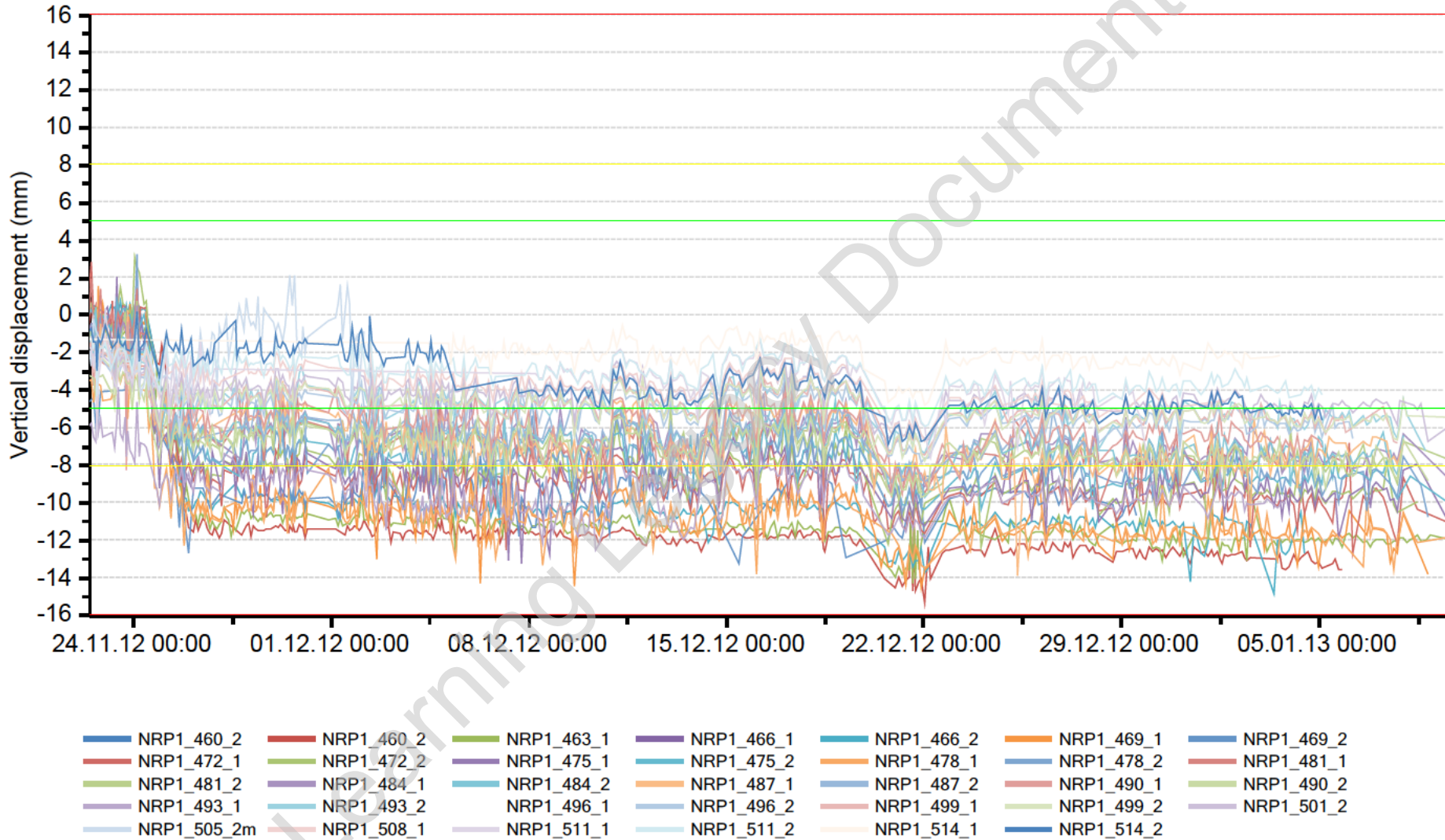


Figure 1- Zone of Influence for Cross Passage works and proposed ATS locations

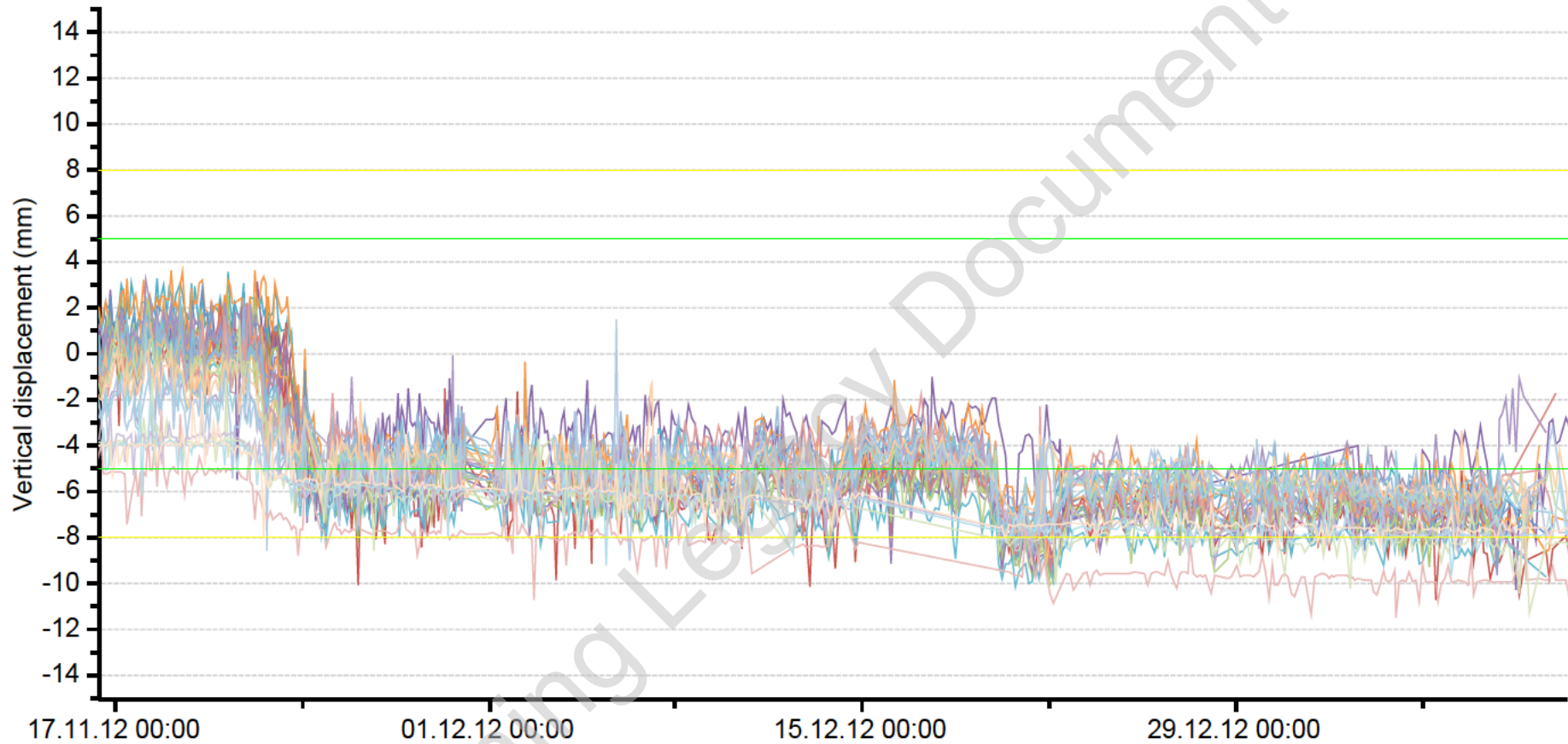
Appendix A: Plotted Paddington Throat Monitoring Data for Period Following the TBM 2 Passage

NRL1 Eastbound West of CL - Settlement



■ **Project: Royal Oak Portal - Paddington**
Reference Date: none
Date of Measurement: 26.03.2013 04:03

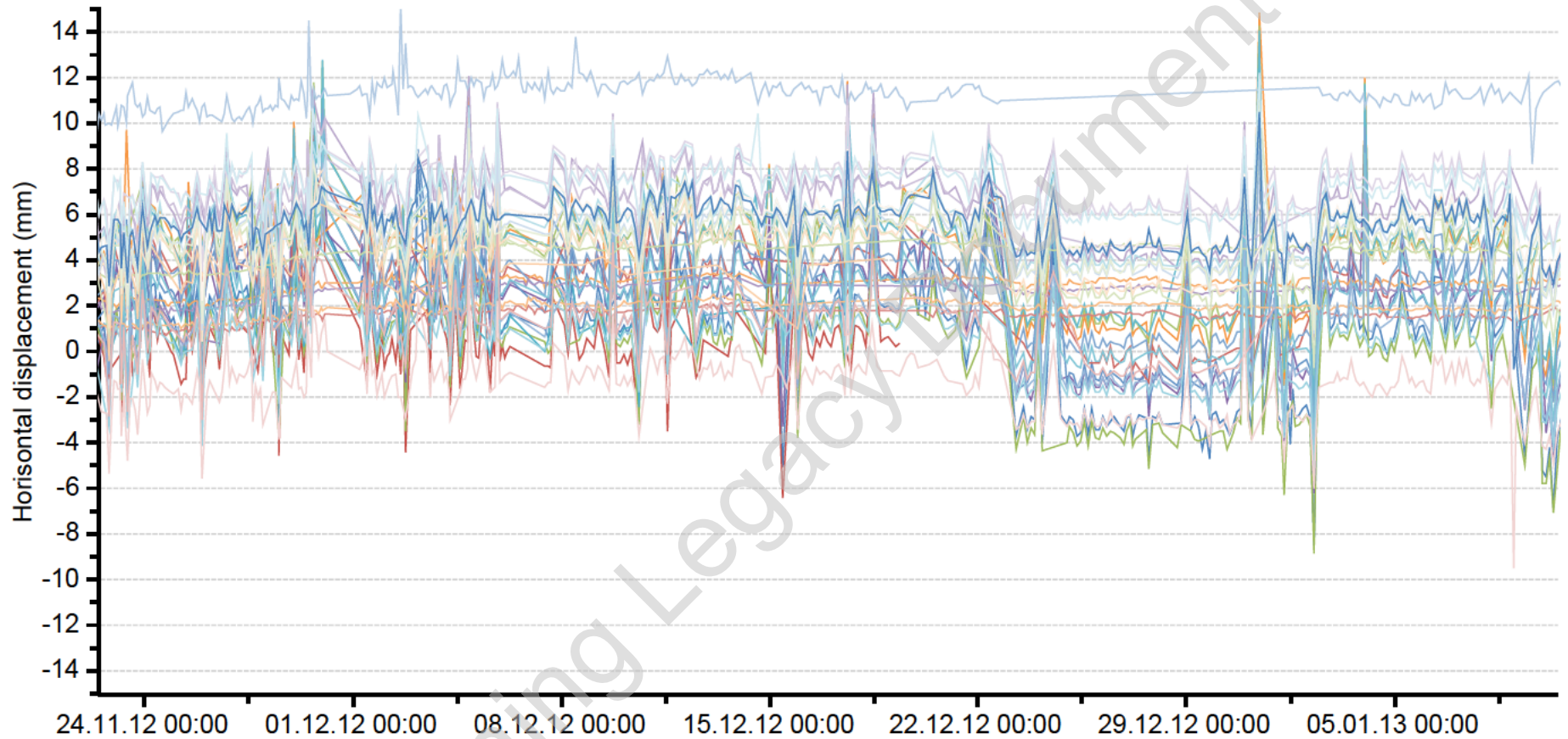
NRL3 Eastbound West of CL - Settlement



- | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|
| NRL3_490_2 | NRL3_493_1 | NRL3_493_2 | NRL3_496_1 | NRL3_496_2 | NRL3_499_1 | NRL3_499_2 | NRL3_502_1 |
| NRL3_502_2 | NRL3_505_1 | NRL3_505_2 | NRL3_508_1 | NRL3_508_2 | NRL3_511_1 | NRL3_514_1 | NRL3_514_2 |
| NRL3_517_1 | NRL3_517_2 | NRL3_520_1 | NRL3_520_2 | NRL3_523_1 | NRL3_523_2 | NRL3_526_1 | NRL3_526_2 |
| NRL3_529_1 | NRL3_529_2 | NRL3_532_1 | NRL3_532_2 | NRL3_535_2 | | | |

■ **Project: Royal Oak Portal - Paddington**
Reference Date: none
Date of Measurement: 26.03.2013 04:03

NRL6 Eastbound West of CL Northings



- | | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| NRL6_526_1 | NRL6_526_2 | NRL6_529_1 | NRL6_532_1 | NRL6_532_2 | NRL6_535_1 | NRL6_538_1 | NRL6_538_2 | NRL6_541_1 |
| NRL6_541_2 | NRL6_544_1 | NRL6_544_2 | NRL6_547_1 | NRL6_547_2 | NRL6_550_2 | NRL6_553_1 | NRL6_553_2 | NRL6_556_1 |
| NRL6_556_2 | NRL6_559_1 | NRL6_559_2 | NRL6_562_1 | NRL6_562_2 | NRL6_565_1 | NRL6_565_2 | NRL6_568_1 | NRL6_568_2 |
| NRL6_571_1 | NRL6_571_2 | NRL6_574_1 | NRL6_574_2 | NRL6_577_1 | NRL6_580_1 | NRL6_580_2 | NRL6_583_1 | NRL6_583_2 |

■ **Project: Royal Oak Portal - Paddington**
Reference Date: none
Date of Measurement: 26.03.2013 04:03