



C510 – Whitechapel and Liverpool Street Station Tunnels

Instrumentation and Monitoring Close Out Report Block 10 Liverpool Street

CRL Document Number: C510-BBM-C2-RGN-C101-50215

Supplier Document Number: N/A

Contract MDL reference: C13.014

1. Contractor Document Submittal History:

Revision:	Date:	Prepared by:	Checked by:	Approved by:	Reason for Issue:
4.0	11/09/2017	[Redacted]	[Redacted]	[Redacted]	For Acceptance

2a. Stakeholder Review Required?

YES NO

Stakeholder submission required: LU RFL Purpose of submission: For no objection
 NR LO For information
 DLR Other: _____

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: _____ Role: _____ Name: _____ Date: _____

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:

		Crossrail Review and Acceptance Decal	
This decal is to be used for submitted documents requiring acceptance by Crossrail.			
<input checked="" type="checkbox"/>	Code 1.	Accepted. Work May Proceed	
<input type="checkbox"/>	Code 2.	Not Accepted. Revise and resubmit. Work may proceed subject to incorporation of changes indicated	
<input type="checkbox"/>	Code 3.	Not Accepted. Revise and resubmit. Work may not proceed	
<input type="checkbox"/>	Code 4.	Received for information only. Receipt is confirmed	
Reviewed/Accepted by (signature)	Print Name:	Position:	Date:
[Redacted Signature]	[Redacted Name]	[Redacted Position]	28/09/17
Acceptance by Crossrail does not relieve the designer/supplier from full compliance with their contractual obligations and does not constitute Crossrail approval of design, details, calculations, analyses, test methods or materials developed or selected by the designer/supplier.			

Document Revision History		
Revision	Date	Purpose
1.0	27/07/2016	For approval
2.0	13/09/2016	For approval
3.0	09/05/2017	For approval to decommission additional I&M
4.0	11/09/2017	For approval

TABLE OF CONTENTS

1	Purpose of Close out Report	4
2	Scope of Monitoring Assessment for Close Out	5
3	Close Out Report Block Description and Location Plan	6
3.1	Block 10 Location	6
3.2	Block 10 Description	7
4	Construction Programme Influencing Block 10	8
4.1	Tunnel Advances Affecting Block 10	9
5	Monitoring Assessment of Block 10	10
5.1	Time Graphs Monitoring Full History and Construction Durations	10
5.2	Block 10 Decommissioning Status Tracker	13
5.3	Supplementary Evidence for Decommissioning	16
5.4	Monitoring sensor Location Plan and Decommissioning Status.....	17
6	Decommissioning Recommendations	20
7	Appendix 1	21
7.1	Sensors Agreed to Decommission in Revision 2	22
7.1	LB & LC Monitoring Sensor Settlement Status and Location Plan (Revision 2)	25
7.2	LP Monitoring Sensor Settlement Status and Location Plan (Revision 2).....	26
7.3	Supplementary Evidence – RP (with Offsets) Monitoring Sensor Settlement Status and Location Plan (Revision 2).....	27
8	Appendix 2	28
8.1	Sensors Agreed to Decommission in Revision 3	29
8.2	LB & LC Monitoring Sensor Decommissioning Status and Location Plan (Revision 3).....	31
8.3	LP & XR Monitoring Sensor Decommissioning Status and Location Plan (Revision 3)	32
8.4	RP & TB Monitoring Sensor Decommissioning Status and Location Plan (Revision 3).....	33
8.5	All Block 10 Building (BRE & LC) Manual Monitoring History in Relation to Construction (Revision 3) 34	
8.6	All Block 10 Road Stud (LP) Manual Monitoring History in Relation to Construction (Revision 3)35	
8.7	All Block 10 Building Prism (RP) Automated Monitoring History in Relation to Construction (Revision 3) 36	
8.8	C510-XR11001 Manual Monitoring History in Relation to Construction (Revision 3)	37
8.9	Tiltmeter (TB) Monitoring History in Relation to Construction (Revision 3).....	38
8.10	Supplementary Evidence for Decommissioning (Revision 3)	39

Figures

FIGURE 1 - LIVERPOOL ST GENERAL LOCATION PLAN - INCLUDING BLOCK 10 MONITORING AREA.....	6
FIGURE 2 - BLOCK 10 ACTIVE ZOI CONSTRUCTION AND REMAINING EOI CONSTRUCTION PLAN.....	8
FIGURE 3 - LB & LC MONITORING SENSOR SETTLEMENT STATUS AND LOCATION PLAN	18
FIGURE 4 – LP MONITORING SENSOR SETTLEMENT STATUS AND LOCATION PLAN	19

Graphs

GRAPH 1- ALL BLOCK 10 BUILDING (BRE & LC) MANUAL MONITORING HISTORY IN RELATION TO CONSTRUCTION	11
GRAPH 2- ALL BLOCK 10 ROAD STUD (LP) MANUAL MONITORING HISTORY IN RELATION TO CONSTRUCTION	12

Tables

TABLE 1 - TUNNEL ADVANCES AFFECTING BLOCK 10	9
TABLE 2 - BLOCK 10 DECOMMISSIONING STATUS TRACKER	15

Learning Legacy Document

(From General Document Template ref: BBMV-Form-S9-04 rev 5.0)

1 Purpose of Close out Report

Materials and Workmanship Specification - Instrumentation and Monitoring (C122-OVE-Z4-RSP-CR001-00007), section KX10.2114 specifies the requirement for a close out report prior to the decommissioning of monitoring sensors and instruments. It is therefore, the purpose of this close out report to gain acceptance to decommission identified monitoring sensors in Block 10 of Crossrail's C510 Liverpool St. Acceptance to decommission sensors will result in ceasing measurements, stopping the reporting and removing sensors.

To gain approval to decommission instrumentation and monitoring, the monitoring data will be analysed to demonstrate settlement does not breach specified rates after the minimum monitoring period is complete.

This revision of the close out report (revision 4) proposes to decommission all remaining sensors not agreed in revision 3. The summary table and associated plots for sensors agreed to be decommissioned in revision 2 are provided in Appendix 1. The summary table, associated plots, graphs and supplementary evidence for sensors agreed to be decommissioned in revision 3 are provided in Appendix 2.

N.B. Monitoring sensors refers to all monitoring points; which includes BREs, road studs, extensometers, inclinometers, tilt meters, crack meters, retros (survey stickers) and prisms. Please note this is not an exhaustive list and does not include monitoring systems/equipment, such as communication boxes.

2 Scope of Monitoring Assessment for Close Out

Specification KX10.4103 of document C122-OVE-Z4-RSP-CR001-00007 states that to establish approval for decommissioning, the contractor is to produce a close out report which summarises the observations in correlation with the construction activities. The report is to demonstrate monitoring has reached acceptable settlement rates; whether to the specified rate, or where no rate is specified trigger values are evaluated against potential residual risks. I&M schedule C122-OVE-C2-DDJ-CR001-Z-31511 specifies the acceptable settlement rates with the requirements to monitor at different construction phases, and duration for completion. To summarise the I&M schedule states that the manual monitoring decommissioning specified rate is 2mm per year, following 16 months post construction monitoring (4 months step down and quarterly measurements for a minimum of 12 months long term monitoring). The I&M schedule does not identify the need for long term automated monitoring or specify a settlement rate requirement, it only states that monitoring must continue for 6 months post construction. At the 6 month juncture, agreement must be sought from the project manager to decommission automated monitoring programmes through a close out report or agreeing to cease the works with the project manager. In most cases decommissioning will be possible, as the residual risk will be captured through the remaining long term manual monitoring.

Contrary to the Specification for Instrumentation and Monitoring (C122-OVE-Z4-RSP-CR001-00007), the Project Managers Instruction (PMI) C510-PMI-01102 replaces long term monitoring with satellite interferometry (InSAR) for the areas agreed by the project manager. If long term monitoring responsibilities are removed from BBMV and covered by satellite interferometry, the specified settlement criteria may not be met by BBMV. If this occurs, reference to the agreement will be provided to state BBMV are no longer responsible for the sensors and consequently decommissioning acceptance will be proposed.

In some cases it may be agreed with the project manager to cease monitoring prior to meeting the specified rates. The close out report will be revised to incorporate these agreements prior to decommissioning. Due to multiple influencers and large construction monitoring zones, it may be prudent to submit successive document revisions for close out reports, where the specification is not met or the minimum post construction monitoring has not been achieved.

3 Close Out Report Block Description and Location Plan

3.1 Block 10 Location

Figure 1 shows the Liverpool St general location plan, C510 tunnel construction and where Block 10 is situated. Detailed location plans can be found within the installation reports and photomontages as listed in Section 3.2. Each monitoring sensor's location is shown within the assessment plans (Section 5.4).

Thames water (sewers and water mains), NGG assets (gas utilities) and a BT tunnel are located in the vicinity of Block 10. The location and details of these assets can be found in Instrumentation and Monitoring Plan: Liverpool Street Station Ground Movement and Asset Protection C122-OVE-C2-RGN-C101-50013 or the relevant C122 prepared Damage Assessment Reports.

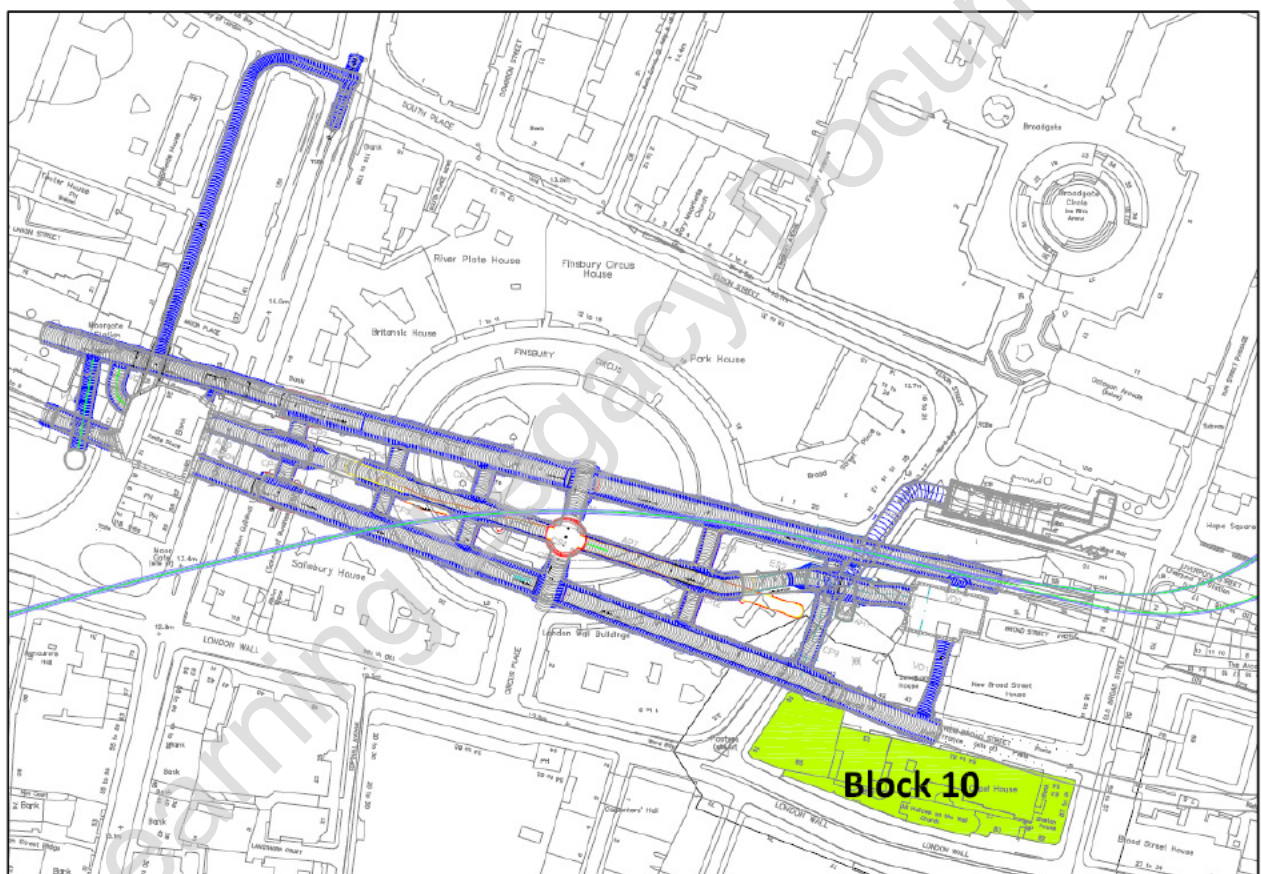


Figure 1 - Liverpool St General Location Plan - including Block 10 monitoring area

3.2 Block 10 Description

Block 10 is located between London Wall and New Broad St. The block is directly adjacent to Platform Tunnel West (PTW) – East of CS1 and within close proximity to ventilation drives and cross passages, further details of the construction programmes are in Section 4. Block 10 contains the following types of monitoring sensors:

- Building (BREs) - manual monitoring
- Building Invar Scale (LC) – manual monitoring
- Road Studs (LP)- manual monitoring
- Building Prism monitoring (RP) – automated monitoring
- Tiltmeters (TB) – automated
- Extensometer (XR) – manual monitoring
- Inclinometer (IM) - manual monitoring

Each monitoring sensors details are listed within the Decommissioning Status Tracker (Table 2) and further relevant information can be sourced from the installation reports.

Block 10 Installation Report References:

- Monitoring Installation Report LIV-LB-10-Liverpool Street
CRL Document Number: C510-BBM-C2-RGN-C101-50136
- Monitoring Installation Report LIV-LC-30-Liverpool Street
CRL Document Number: C510-BBM-C2-RGN-C101-50138
- Monitoring Installation Report LIV-LP-10 – Liverpool Street
CRL Document Number: C510-BBM-C2-RGN-C101-50129 (Superseded - With LIV-LP-30)
- Monitoring Installation Report LIV-LP-30 – Liverpool Street
CRL Document Number: C510-BBM-C2-RGN-C101-50163
- Monitoring Installation Report New Broad St. (Block-10), Liverpool St
CRL Document Number: C510-BBM-C2-RGN-C101-50010
- Monitoring Instrumentation C510-IM11001 – Liverpool Street - Inclinometer
CRL Document Number: C510-BBM-C2-RGN-C101-50089
- Monitoring Instrumentation C510-XR11001 – Liverpool Street - Extensometer
CRL Document Number: C510-BBM-C2-RGN-C101-50087

N.B. Block 30 road studs replaced Block 10 road studs. The reason for the replacement was to fulfil the I&M plan by increasing monitoring density. The Block 30 road studs will be referred as Block 10 road studs.

The settlement Drawing C122-OVE-C2-DDA-CR001_Z-21313, predicts the Block 10 area to receive between 5-50mm of settlement.

4 Construction Programme Influencing Block 10

Extent of Influence (EOI) monitoring areas were established to record ground movements in relation to C510 construction. The EOI purpose is to ensure all assets and areas are adequately monitored for movement during construction, this is achieved by controlling when and how often monitoring occurs. The Asset Protection Instrument and Monitoring (I&M) Schedules (C122 –OVE-C2-DDJ-CR001_Z-31511) states the extent of influence (EOI) of an active tunnel is 2 x depth from the active tunnel face. The EOI is used to determine when monitoring sensors are no longer influenced by construction and can be considered for decommissioning.

The original specification received amendments to manual monitoring frequency within the EOI through several PMIs, with the latest PMI (C510-PMI-01103) establishing an Active ZOI (Zone of Influence) as 2 x tunnel diameter from the active tunnel face projected to the surface. The Active ZOI changed the rates of monitoring frequency, it did not replace EOI. The EOI is used to determine when a monitoring sensor is eligible for decommissioning. Whereas, active ZOI is used to analyse manual monitoring movement against construction.

To identify the tunnels that had the potential to significantly affect Block 10, a ZOI area was established by giving each monitoring sensor a radius of 2.0 x tunnel diameter from the exposed face. This area was then used to determine all the mining advances that occurred within its boundary, Figure 2 shows this area (green outline) and the tunnels. The tunnel's advances start and finish date was used in assessment of the monitoring data. In addition to the Active ZOI, the initial and final EOI construction is also identified (Table 1). In addition to the C510 BBMV SCL tunnelling works, the only other tunnel that affects Block 10 is the Westbound TBM tunnel drive from the East, TBM West to the SCL Reception Chamber, which has been included for decommissioning assessment.

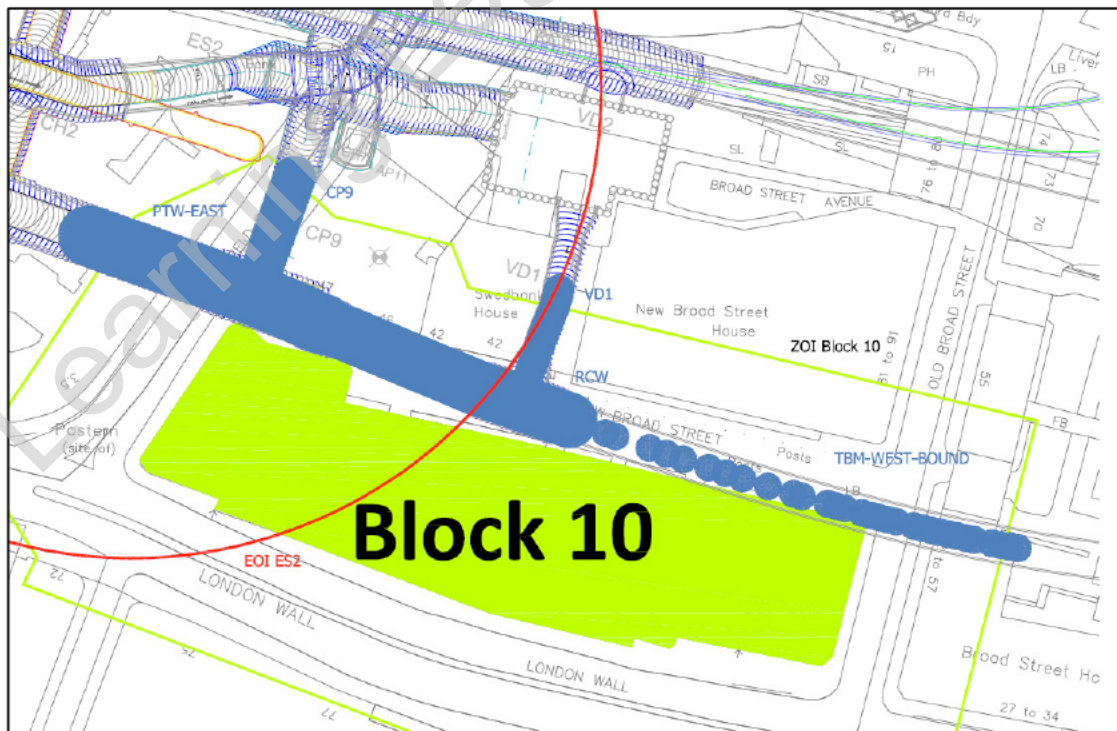


Figure 2 - Block 10 Active ZOI Construction and Remaining EOI Construction Plan

4.1 Tunnel Advances Affecting Block 10

The information presented in Table 1 is used in the monitoring graphs (Section 5.1), to show the ground movements in relation to construction.

TUNNEL ADVANCES STARTS & ENDS FOR GRAPHS							
Tunnel Code	Tunnel Reference	Primary Layer Type	Start Date	End Date	Start Advance	End Advance	Zone
ES2-Enlargement	ES2	Enlargement	28/10/2016	20/11/2016	7	45	EOI
TBM-West-RC-Pilot	TBM-West-RC	Pilot	05/03/2015	12/03/2015	3959	4008	ZOI
CP9-Enlargement	CP9	Enlargement	13/08/2014	23/08/2014	16	32	ZOI
CP9-Pilot	CP9	Pilot	20/07/2014	23/07/2014	16	31	ZOI
VD1-Enlargement	VD1	Enlargement	28/05/2014	03/06/2014	3	22	ZOI
RCW-Enlargement	RCW	Enlargement	14/04/2014	07/05/2014	1	71	ZOI
PTW-East-Enlargement	PTW-East	Enlargement	24/03/2014	14/04/2014	107	176	ZOI
RCW-Pilot	RCW	Pilot	18/10/2013	28/10/2013	1	42	ZOI
PTW-East-Pilot	PTW-East	Pilot	06/10/2013	18/10/2013	77	125	ZOI
AP7 East-Pilot	AP7 East	Pilot	29/10/2012	14/02/2013	25	42	EOI

Table 1 - Tunnel Advances Affecting Block 10

N.B. The advance number for TBM headings, is the advance ring number.

Heading Index:

AP – Access Passage

CH - Chamber

CP - Cross Passage

ES – Escalator

GAD – Grout Adit

LCE - Launch Chamber East

LCW – Launch Chamber West

PTE – Platform Tunnel East

PTW – Platform Tunnel West

RCE – Reception Chamber East

RCW – Reception Chamber West

TBM – Tunnel Boring Machine

VD – Ventilation Drive

5 Monitoring Assessment of Block 10

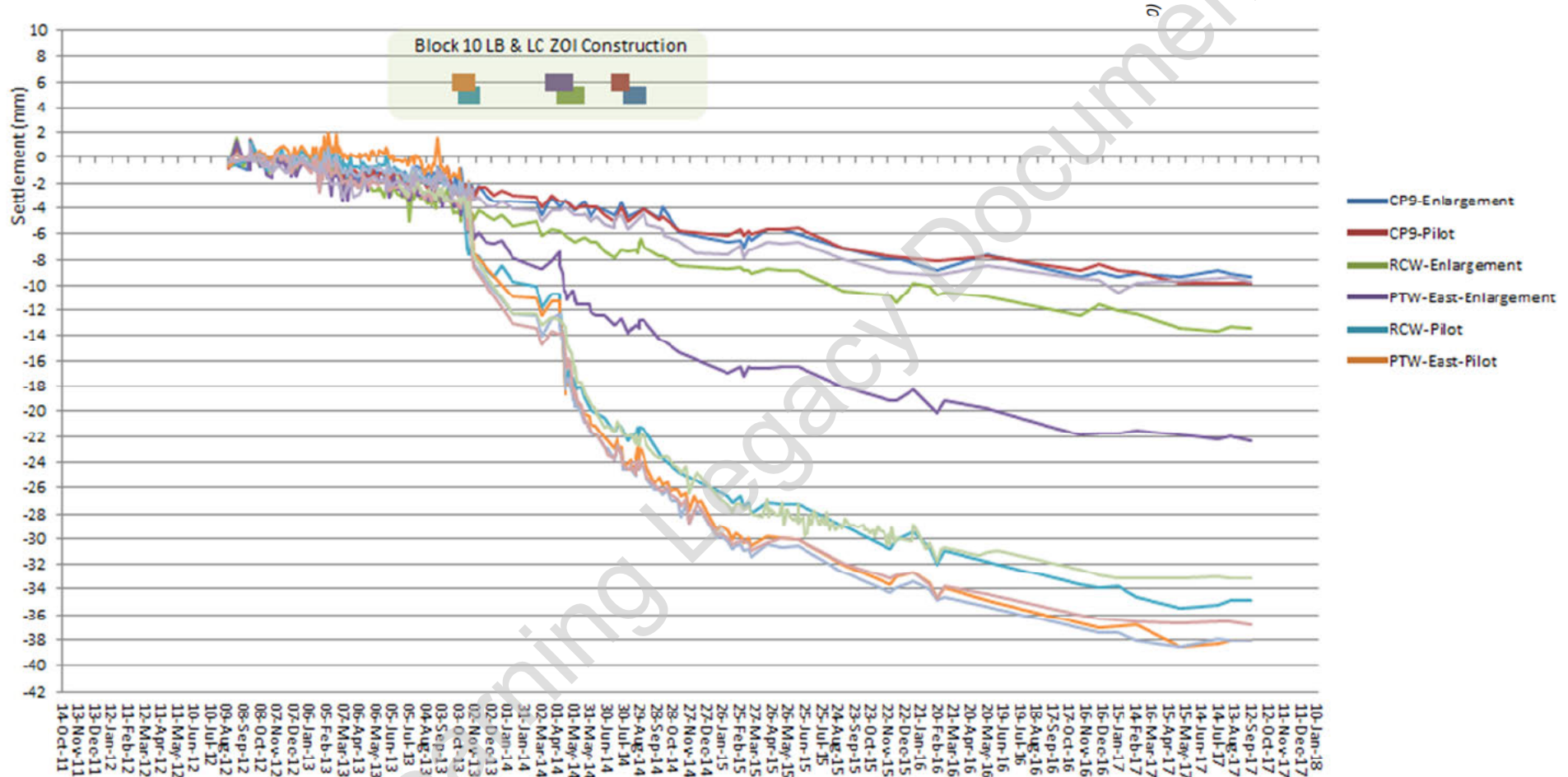
Evidence for decommissioning each monitored sensor is shown through graphs, tables (decommissioning status tracker) and plans. Each element of assessment compliments the other and is used together to determine acceptance of decommissioning. The decommissioning status tracker (Table 2) highlights the monitoring sensors to be considered for decommissioning and provides the supporting evidence for the decision. In some cases supplementary evidence is required to prove stability or provide reasoning for decommissioning.

5.1 Time Graphs Monitoring Full History and Construction Durations

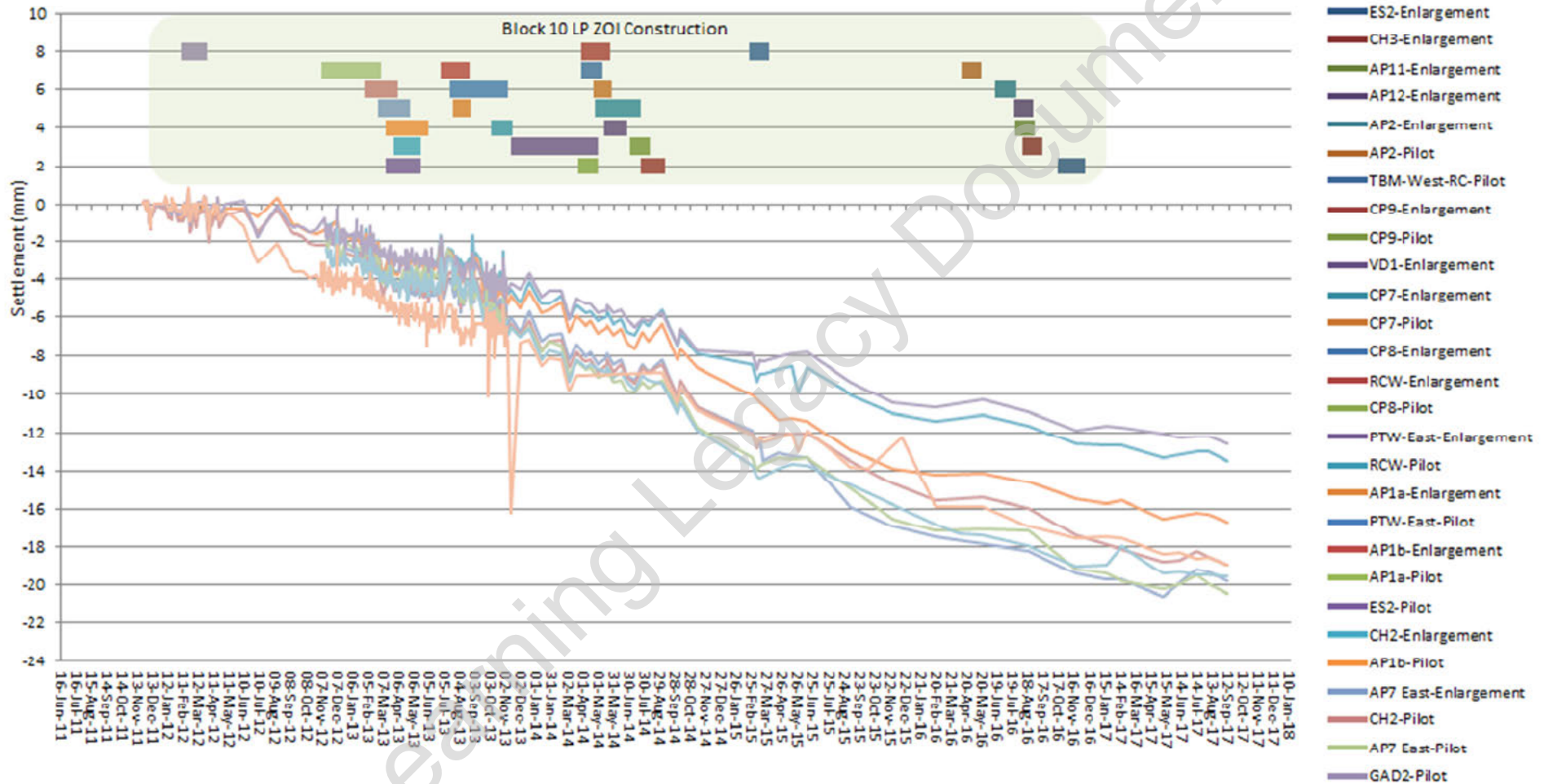
To assess the movement of Block 10 monitoring sensors; each monitoring sensor data type is displayed in a line graph, with a gantt chart (bar) representing the construction identified in Section 4:

- Graph 1- All Remaining Block 10 Building (BRE & LC) Manual Monitoring History in Relation to Construction
- Graph 2- All Remaining Block 10 Road Stud (LP) Manual Monitoring History in Relation to Construction

Graph 1- All Remaining Block 10 Building (BRE & LC) Manual Monitoring History in Relation to Construction



Graph 2- All Remaining Block 10 Road Studs (LP) Manual Monitoring History in Relation to Construction



5.2 Block 10 Decommissioning Status Tracker

The decommissioning tracker identifies (Table 2) each monitoring sensor and provides the critical information to enable decommissioning assessment for each sensor. The initial fields shown in the tracker are descriptors of the monitoring sensor, whilst the remaining fields are the assessment for decommissioning. The purpose of the tracker is to provide Crossrail reviewers with sufficient information in conjunction with construction movement graphs and plots, to accept BBMV's proposal to decommission sensors on an individual basis.

Detailed explanation of the tracker column headers:

Tracker Column Header – Last Construction Date and Traffic Lights

To determine the last influencing construction works for each sensor, the Active ZOI parameter was used. All construction tunnelling advances within the 2 x diameter radius were listed for each sensor, from these lists the latest advance date is used as an indicator. A traffic light system is used to highlight when a sensor has surpassed defined monitoring time frames 4 months (120 days), 6 months (180 days) and 1 year (365 days)

N.B. Each monitoring sensor's last affecting primary construction heading and advance number's completion date has been listed within the Decommissioning Status Tracker. The last construction heading listed, is not the closest to the monitoring sensor, but the last completed within the 2 x diameter radius. Not all sensors are within a distance of 2 x diameter of a tunnel advance location. If this scenario occurs the last completed heading within Block 10's Active ZOI is used as a reference.

Tracker Column Header – 120, 180 & 365 Days Average Settlement Trend

There are three average settlement trends, which tie into the defined monitoring time frames; 120, 180 and 365 days. The calculation used to determine the trend is the same for all three periods. It is a slope calculation (explained below) of the defined period, multiplied over one year. The trend is calculated from the latest reading and includes all readings within the defined period, which is averaged and then multiplied over 1 year. If there is no initial reading for the time frame date, the calculation will continue back to include the next available date. This is an important consideration when assessing the trend and to assist the reviewers, the time frame used within the calculation is included within the decommissioning tracker status table. Defined monitoring time frames:

- The 120 day average rate is used to show the completion of manual monitoring step down period, this is the minimum period of monitoring prior to InSAR taking monitoring responsibility.
- The 180 day average rate is the minimum monitoring period after construction for automated sensors.
- The 365 day average trend is the desired period to be used if the long term monitoring has been completed for decommissioning evidence. The specification states that if the trend is below 2mm/yr, then the sensor is eligible for decommissioning.

Slope calculation Settlement Trend:

Description – The settlement trend calculates the slope of the linear regression line through data points in known_y's and known_x's. The slope is the vertical distance divided by the horizontal distance between any two points on the line, which is the rate of change along the regression line.

Calculation

$$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

Example - If the calculated trend for a 6 month period is 1.5mm, it is multiplied into 365 days, to equal a projected settlement trend of 3mm over 1 year.

Tracker Column Header – ERP Ceased date

ERP and CTC meetings have identified project efficiencies, by ceasing manual monitoring programmes early, or prior to reaching 2mm/yr. InSAR may have taken responsibility of monitoring or the perceived risk may be low enough to warrant ceasing the monitoring. In these situations the cease date is provided, along with a comment explaining the reasoning. Monitoring that has been ceased still requires approval to decommission and will be identified within the decommissioning status tracker as proposed to decommission.

Tracker Column Header – Decommissioning Status

The status is the decommissioning situation for each sensor within Block 10. The different statuses are as follows:

- Outstanding - Monitoring sensor has not met the close out requirements and approval to decommission will be sought in subsequent revisions of this close out report.
- Proposed - the sensor is proposed to be decommissioned. Crossrail to accept the sensor can be decommissioned.
- Agreed – Agreed to decommission through previous revision of the close out report. No further reporting or monitoring has taken place.
- Complete - Monitoring sensor has been removed and evidence gathered during decommissioning.

N.B. When monitoring sensors have not met the requirements, it may still be appropriate to decommission. In this scenario supplementary evidence will be provided to explain the reasoning for decommissioning.

Table 2 - Block 10 Decommissioning Status Tracker

12/09/2017

< 2.0 mm GREEN < 3.5 mm AMBER > 3.5 mm RED

C510 Sensor Name	Block	Section	Int / Ext	Measurement Type	Sensor Type	Sensor Description	Asset/Location	EOI Last Primary Layer Construction	Last Construction Date	Latest Surveyed Date	AVERAGE SETTLEMENT TREND					Ceased Date	General Comment	Decommissioning Status	
											120 Day	120 Day Calculation Period	180 Day	180 Day Calculation Period	365 Days				365 Day Calculation Period
C510-LB11022	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	0.41	126	0.01	205	-0.84	477			Proposed
C510-LB11023	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	0.00	126	-1.32	205	-1.72	477			Proposed
C510-LB11024	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	0.12	126	-1.82	205	-2.08	477		Stable 6 month trend	Proposed
C510-LB11025	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	-1.29	126	-1.36	205	-1.49	477			Proposed
C510-LB11026	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	1.89	126	-0.26	205	-2.42	477		Stable 6 month trend	Proposed
C510-LB11027	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	1.26	126	-2.00	205	-2.56	477			Proposed
C510-LB11028	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	1.51	126	0.32	205	-1.93	477			Proposed
C510-LB11029	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	-0.17	126	-0.18	205	-1.56	477			Proposed
C510-LB11032	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	0.05	126	0.14	205	-1.38	458			Proposed
C510-LC11028	Block 110	S11006	External	Manual	LC	Invar Scale	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	08/09/2017	0.48	205	0.48	205	-0.46	477			Proposed
C510-LP13037	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CH3_Enlargement_Adv-11	28/08/2016	08/09/2017	-0.27	126	-0.91	205	-1.37	387			Proposed
C510-LP13038	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CH3_Enlargement_Adv-11	28/08/2016	08/09/2017	-0.35	126	-1.48	205	-1.71	387			Proposed
C510-LP13039	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Invert_Adv-14	13/11/2016	08/09/2017	2.77	126	0.85	205	-0.89	387			Proposed
C510-LP13040	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Safe_Stop_Adv-10	24/11/2016	08/09/2017	0.04	126	-0.34	205	-2.28	387		Stable 6 month trend	Proposed
C510-LP13041	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Safe_Stop_Adv-10	24/11/2016	08/09/2017	-0.64	126	-0.62	205	-2.27	387			Proposed
C510-LP13042	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Safe_Stop_Adv-10	24/11/2016	08/09/2017	-1.32	126	-1.33	205	-1.27	387			Proposed
C510-LP13043	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Safe_Stop_Adv-10	24/11/2016	08/09/2017	-0.71	126	-2.64	205	-1.42	387			Proposed
C510-LP13044	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_ES2_Safe_Stop_Adv-10	24/11/2016	08/09/2017	-1.43	126	-2.06	205	-1.79	387			Proposed

Learning Legacy Doc

5.3 **Supplementary Evidence for Decommissioning**

In some cases, supplementary evidence will be provided to support the decommissioning evidence. No supplementary evidence was required in this instance.

Learning Legacy Document

5.4 Monitoring sensor Location Plan and Decommissioning Status

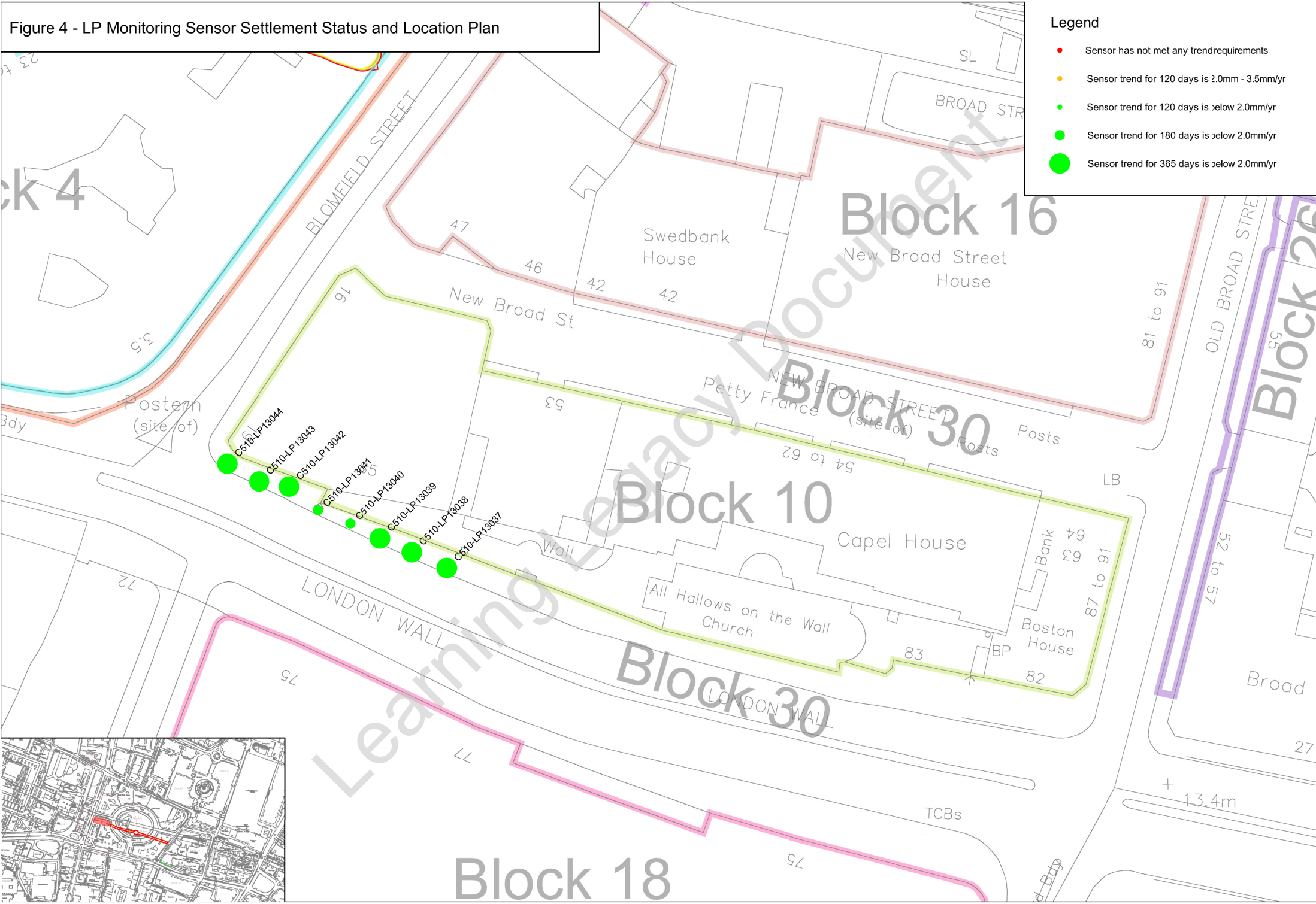
The following plots provide a visual representation of all remaining Block 10 monitoring sensors not decommissioned in Revision 3, with a colour circle that defines its settlement status. A green circle represents when a trend is below 2mm/yr and the larger the circle the greater the trend period. When a trend has not been met, a small red circle will represent the monitoring sensor. There are two plans for Block 10 monitoring sensors:

- Figure 3 - LB & LC Monitoring Sensor Settlement Status and Location Plan
- Figure 4 – LP Monitoring Sensor Settlement Status and Location Plan

Learning Legacy Document

Figure 4 - LP Monitoring Sensor Settlement Status and Location Plan

- Legend**
- Sensor has not met any trend requirements
 - Sensor trend for 120 days is 2.0mm - 3.5mm/yr
 - Sensor trend for 120 days is below 2.0mm/yr
 - Sensor trend for 180 days is below 2.0mm/yr
 - Sensor trend for 365 days is below 2.0mm/yr



6 Decommissioning Recommendations

Revision 4 of Block 10's close out report requests all remaining monitoring sensors to be decommissioned. The decommissioning status tracker (Table 2) identifies the monitoring sensors to be decommissioned.

N.B. When required, decommissioning and re-instatement evidence will be collected during the removal of monitoring sensors, which will be included within the final report.

Learning Legacy Document

7 Appendix 1

Appendix 1 includes the Graphs, Tables, Supplementary Evidence and Figures that were used as evidence to agree decommissioning in Revision 2 of Block 10 Close out Report.

Learning Legacy Document

Table 2 - Block 10 Decommissioning Status Tracker

Export CloseOut Sensor Status AutoCAD Script

< 2.0 mm GREEN	< 3.5 mm AMBER	> 3.5 mm RED
----------------	----------------	--------------

09/08/2016

AVERAGE SETTLEMENT TRENDS

C510 Sensor Name	Block	Section	Int / Ext	Measurement Type	Sensor Type	Sensor Description	Asset	ZOI Last Primary Layer Construction	Last Construction Date	Latest Surveyed Date	120 Days	120 Day Calculation Period	180 Days	180 Day Calculation Period	365 Days	365 Day Calculation Period	Ceased Date	General Comment	Decommissioning Status
C510-AT110107	Block 110	N/A	External	Automated	AT	Total Station	85 London Wall	N/A	N/A		#N/A		#N/A		#N/A		N/A	Do not remove/decommission until entire auto network complete	Outstanding
C510-AT110108	Block 110	N/A	External	Automated	AT	Total Station	Boston House	N/A	N/A		#N/A		#N/A		#N/A		N/A	Do not remove/decommission until entire auto network complete	Outstanding
C510-AT110111	Block 110	N/A	External	Automated	AT	Total Station	85 London Wall	N/A	N/A		#N/A		#N/A		#N/A		N/A	Do not remove/decommission until entire auto network complete	Outstanding
C510-IM11001	Block 110	IM11001	Inground	Manual	IM	Inclinometer-Manual	New Broad St	LIV_VD1_Enlargement_Adv-6	30/05/2014	26/01/2016	0.00	132	0.00	190	0.00	405	29/01/2016	Ceased through C510-PMI-01083 29.01.2016	Proposed
C510-TB11001	Block 110	C510-TB11001	External	Automated	TB	Tiltmeter-Biaxial	Capel House	LIV_TBM-West-RC_Pilot_Adv-4008	12/03/2015	29/06/2016	-1.85	120	-0.50	180	0.20	365		Stable 28/06/2016	Proposed
C510-TB11002	Block 110	C510-TB11002	External	Automated	TB	Tiltmeter-Biaxial	Capel House	LIV_TBM-West-RC_Pilot_Adv-4008	12/03/2015	29/06/2016	0.00	120	0.00	180	0.05	365		Stable 28/06/2016	Proposed
C510-TB11003	Block 110	C510-TB11003	External	Automated	TB	Tiltmeter-Biaxial	53 New Broad St	LIV_VD1_Enlargement_Adv-12	30/05/2014	29/06/2016	0.05	120	0.00	180	-0.10	365		Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-TB11004	Block 110	C510-TB11004	External	Automated	TB	Tiltmeter-Biaxial	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	29/06/2016	0.90	120	0.95	180	0.00	365		Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-XR11001	Block 110	XR11001	Inground	Manual	XR	Extensometer-Rod	New Broad St	LIV_TBM-West-RC_Pilot_Adv-4008	12/03/2015	24/06/2016	-1.98	124	-3.10	195	-2.89	381		Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11001	Block 110	S11001	External	Manual	LB	BRE	Capel House	LIV_VD1_Enlargement_Adv-20	03/06/2014	19/05/2016	-0.94	176	-2.85	260	-3.80	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11002	Block 110	S11001	External	Manual	LB	BRE	Capel House	LIV_RCW_Enlargement_Adv-71	07/05/2014	19/05/2016	0.27	176	-1.35	260	-2.59	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11003	Block 110	S11001	External	Manual	LB	BRE	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.06	176	-1.89	260	-2.83	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11004	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.42	176	-1.24	260	-2.37	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11005	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.59	176	-1.41	260	-2.24	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11006	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.67	176	-1.26	260	-2.52	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11007	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.67	176	-1.51	260	-2.40	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11008	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.66	176	-1.15	260	-2.02	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11009	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.26	176	-0.73	260	-1.87	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11010	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.32	176	-1.99	260	-2.59	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11011	Block 110	S11002:S11003	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.18	176	-2.95	260	-2.79	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11012	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.87	176	-0.39	260	-1.50	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11013	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.98	176	-1.11	260	-0.90	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11014	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.22	176	-0.95	260	-2.79	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11015	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.87	176	-0.93	260	-2.29	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11016	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-0.24	260	-1.54	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11017	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.18	176	-1.20	260	-2.40	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11018	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.98	176	-1.41	260	-2.47	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11019	Block 110	S11003	External	Manual	LB	BRE	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.77	176	-1.57	260	-2.47	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11020	Block 110	S11004	External	Manual	LB	BRE	All Hallows Church	LIV_RCW_Enlargement_Adv-71	07/05/2014	17/10/2012	No Data		No Data		No Data		14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11021	Block 110	S11004	External	Manual	LB	BRE	All Hallows Church	LIV_RCW_Enlargement_Adv-64	05/05/2014	21/10/2013	-9.72	139	-12.55	188	-7.67	369	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11022	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.18	157	-0.83	260	-2.57	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11023	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-0.86	260	-2.51	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11024	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-2.76	133	-0.23	260	-1.97	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11025	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-2.81	133	-2.31	260	-3.63	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11026	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-5.06	133	-3.90	260	-4.81	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11027	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-5.42	133	-3.91	260	-4.98	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11028	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-4.75	133	-3.41	260	-4.79	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11029	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-3.74	133	-3.80	260	-4.85	372	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11030	Block 110	S11001:S11006	External	Manual	LB	BRE	53 New Broad St	LIV_VD1_Enlargement_Adv-13	30/05/2014	07/06/2016	0.91	130	-0.85	186	-2.65	367	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11031	Block 110	S11001	External	Manual	LB	BRE	Capel House	LIV_VD1_Enlargement_Adv-22	03/06/2014	07/06/2016	1.31	130	0.08	186	-2.49	367	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11032	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	07/06/2016	-0.86	125	-2.93	184	-3.17	367	14/06/2016	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-LB11033	Block 110	S11002	External	Manual	LB	BRE	Boston House	LIV_CP9_Enlargement_Adv-32	23/08/2014	07/06/2016	1.51	130	0.15	186	-1.91	367	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LB11034	Block 110	S11006	External	Manual	LB	BRE	53 New Broad St	LIV_VD1_Enlargement_Adv-10	30/05/2014	07/06/2016	-3.24	186	-3.24	186	Out of Range		14/06/2016	Decommission - no longer required as a level transfer for LB11035 12/09/2016	Proposed
C510-LB11035	Block 110	S11006	External	Manual	LB	BRE	53 New Broad St	LIV_VD1_Enlargement_Adv-10	30/05/2014		No Data		No Data		No Data		14/06/2016	No further access to monitoring point, following refurbishment 12/09/2016	Proposed
C510-LC11001	Block 110	S11005	External	Manual	LC	Invar Scale	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.84	157	-0.97	260	-2.12	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11002	Block 110	S11004	External	Manual	LC	Invar Scale	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.59	157	-0.69	260	-1.92	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11003	Block 110	S11005	External	Manual	LC	Invar Scale	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.84	157	-0.83	260	-2.08	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11004	Block 110	S11004	External	Manual	LC	Invar Scale	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.05	157	-0.75	260	-2.13	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11005	Block 110	S11004	External	Manual	LC	Invar Scale	All Hallows Church	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.54	157	-0.89	260	-2.00	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11006	Block 110	S11005	External	Manual	LC	Invar Scale	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.32	157	-1.06	260	-2.12	372	14/06/2016	CTC 14.06.2016 Confirmed monitoring to be replaced by InSAR.	Proposed
C510-LC11007	Block 110	S110																	

Table 2 - Block 10 Decommissioning Status Tracker

Export CloseOut Sensor Status
AutoCAD Script

< 2.0 mm GREEN	< 3.5 mm AMBER	> 3.5 mm RED
----------------	----------------	--------------

09/08/2016

AVERAGE SETTLEMENT TRENDS

C510 Sensor Name	Block	Section	Int / Ext	Measurement Type	Sensor Type	Sensor Description	Asset	ZOI Last Primary Layer Construction	Last Construction Date	Latest Surveyed Date	120 Days	120 Day Calculation Period	180 Days	180 Day Calculation Period	365 Days	365 Day Calculation Period	Ceased Date	General Comment	Decommissioning Status
C510-LP13001	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-14	30/05/2014	05/04/2016	-1.58	132	-3.22	216	-8.81	748		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13002	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-18	02/06/2014	19/05/2016	-0.78	176	-2.16	195	-4.14	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13003	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-21	03/06/2014	19/05/2016	-0.68	157	-2.93	260	-4.83	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13004	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-22	03/06/2014	19/05/2016	-0.56	176	-2.44	260	-3.75	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13005	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	19/05/2016	-0.68	138	-2.38	195	-3.81	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13006	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	19/05/2016	-0.72	176	-2.12	195	-3.62	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13007	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	19/05/2016	-0.78	176	-2.28	260	-3.59	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13008	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-21	03/06/2014	19/05/2016	-0.79	176	-2.21	195	-3.64	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13009	Block 110	S11001,S11002	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-17	01/06/2014	19/05/2016	-0.97	176	-2.14	223	-3.05	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13010	Block 110	S11001,S11002	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-9	30/05/2014	19/05/2016	0.04	176	-1.61	260	-2.79	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13011	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_RCW_Enlargement_Adv-71	07/05/2014	19/05/2016	0.04	176	-1.61	260	-2.84	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13012	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_RCW_Enlargement_Adv-71	07/05/2014	19/05/2016	-0.11	138	-1.78	260	-2.72	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13013	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.17	176	-1.40	195	-2.82	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13014	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.03	176	-1.66	260	-3.46	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13015	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.18	176	-1.70	260	-2.57	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13016	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.02	176	-1.74	260	-2.81	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13017	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.19	176	-1.25	260	-2.93	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13018	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.40	176	-1.50	260	-2.69	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13019	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.60	157	-2.26	260	-2.98	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13020	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.05	176	-1.23	260	-2.21	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13021	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.47	176	-0.85	260	-2.10	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13022	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.86	176	-0.98	260	-1.96	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13023	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.66	176	-1.15	260	-2.07	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13024	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.45	176	-1.27	260	-2.40	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13025	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.99	124	-0.80	222	-1.76	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13026	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-1.74	260	-3.44	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13027	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.85	176	-0.69	260	-2.25	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13028	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.64	176	-1.15	260	-2.70	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13029	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.98	157	-0.64	260	-2.51	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13030	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.01	176	-1.88	260	-3.03	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13031	Block 110	S11003,S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.20	176	-1.29	260	-2.17	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13032	Block 110	S11003,S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-1.11	260	-2.44	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13033	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.64	176	-0.62	222	-2.25	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13034	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-1.11	260	-2.50	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13035	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.24	176	-1.14	222	-2.38	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13036	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.18	176	-1.08	260	-2.52	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13037	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.19	176	-1.54	260	-2.57	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13038	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-0.40	176	-1.63	260	-3.16	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13039	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	17/02/2016	-3.48	168	-5.91	252	-5.62	466		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13040	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.42	176	-2.76	260	-3.88	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13041	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.22	176	-3.05	260	-4.27	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13042	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.23	176	-1.96	260	-2.89	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13043	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-4.17	344	-4.17	344	-4.07	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13044	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-7.81	157	-4.74	222	-3.51	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13045	Block 110	S11005	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.08	176	-0.60	196	-1.01	381		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13046	Block 110	S11005	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	1.30	157	0.12	196	-1.69	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding
C510-LP13047	Block 110	S11005	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	0.00	176	-0.75	260	-2.06	372		Continue to monitor, decommissioning specification not met 12/09/2016	Outstanding

Learning

Table 3 - Block 10 Decommissioning Status Tracker

< 2.0 mm GREEN	< 3.5 mm AMBER	> 3.5 mm RED
----------------	----------------	--------------

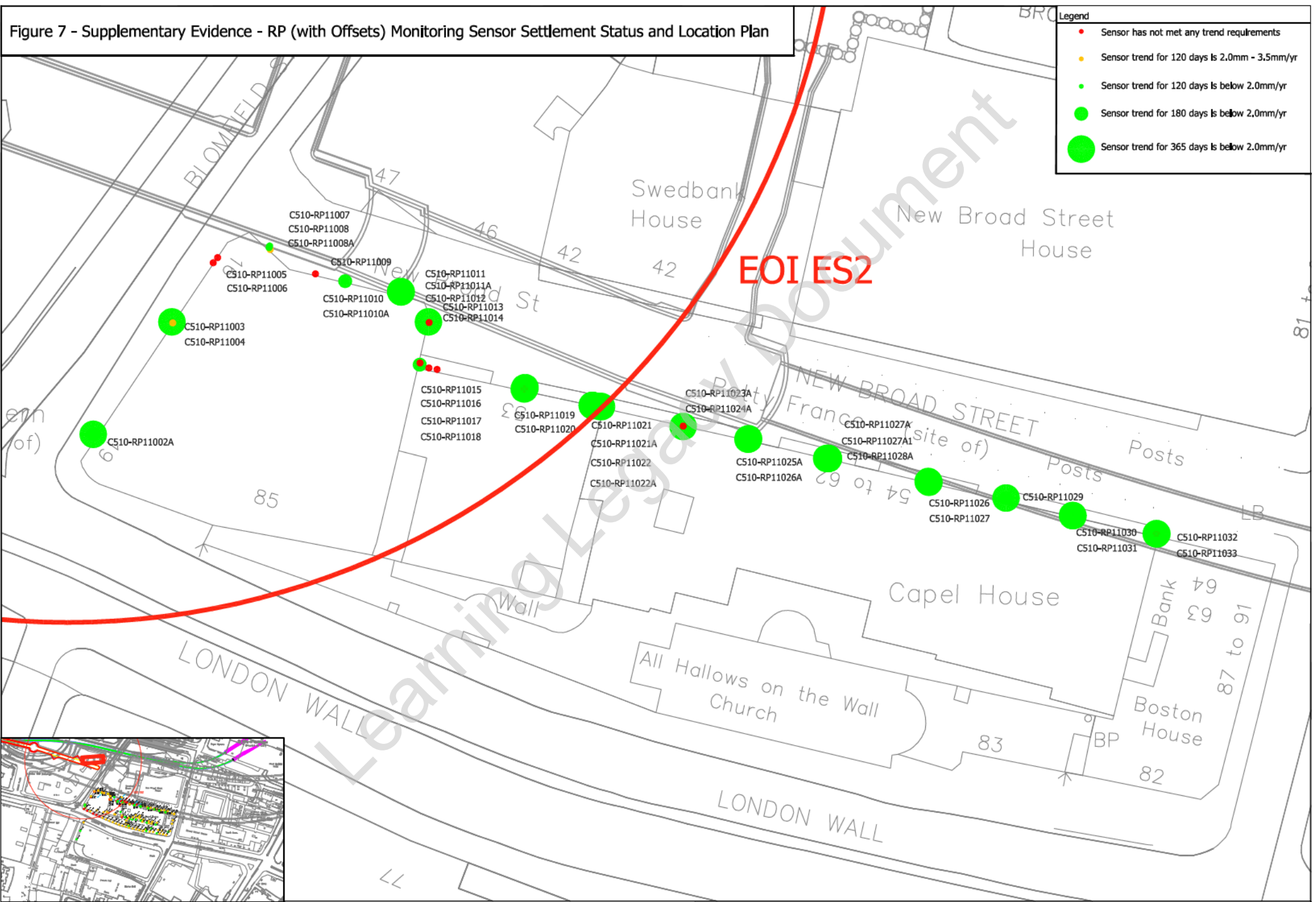
09/08/2016

C510 Sensor Name	Block	Section	Int / Ext	Measurement Type	Sensor Type	Sensor Description	Asset	Last Primary Layer Construction	Last Construction Date	Latest Surveyed Date	AVERAGE SETTLEMENT TREND				Ceased Date	General Comment	Decommissioning Status	
											120 Days	120 Day Calculation Period	180 Days	180 Day Calculation Period				365 Days
C510-RP11001	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Installed - No Data 28/06/2016	Proposed		
C510-RP11002A	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-1.96	120	-0.48	180	-1.49	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11003	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-5.28	120	-3.54	180	-1.94	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11004	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-3.37	120	-2.02	180	-2.49	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11005	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-8.63	1337	-8.63	1337	-8.63	1337	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11006	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-4.10	120	-3.50	180	-3.27	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11007	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-3.19	120	-4.35	180	-2.11	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11008	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-1.31	120	-2.49	180	-2.63	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11009	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-3.54	120	-4.30	180	-2.06	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11010	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-0.20	120	-1.55	180	-2.35	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11011	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-2.69	120	-3.67	180	-1.69	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11012	Block 110	S11001	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-0.30	120	-2.04	180	-2.33	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11013	Block 110	S11002	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-3.47	120	-4.15	180	-1.55	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11014	Block 110	S11002	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	27/06/2016	-4.68	120	-4.15	180	-2.03	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11015	Block 110	S11002	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_RCW_Enlargement_Adv-55	03/05/2014	01/02/2013	-0.04	120	0.31	180	Out of Range	#N/A	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11016	Block 110	S11002	External	Automated	RP	3D Geodetic prism	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	27/06/2016	-2.36	120	-2.09	180	-0.91	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11017	Block 110	S11003	External	Automated	RP	3D Geodetic prism	53 New Broad St	LIV_RCW_Enlargement_Adv-56	03/05/2014	24/05/2016	-18.37	120	-10.04	180	-1.31	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11018	Block 110	S11003	External	Automated	RP	3D Geodetic prism	53 New Broad St	LIV_RCW_Enlargement_Adv-58	04/05/2014	28/06/2016	-0.72	120	-1.82	180	-0.83	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11019	Block 110	S11003	External	Automated	RP	3D Geodetic prism	53 New Broad St	LIV_VD1_Enlargement_Adv-13	30/05/2014	28/06/2016	-5.67	120	-4.59	180	-1.15	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11020	Block 110	S11003	External	Automated	RP	3D Geodetic prism	53 New Broad St	LIV_VD1_Enlargement_Adv-13	30/05/2014	28/06/2016	-4.04	120	-3.63	180	-1.11	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11021	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-18	02/06/2014	28/06/2016	-4.33	120	-4.22	180	-1.22	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11022	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-18	02/06/2014	11/09/2013	-2.59	120	-3.19	180	-1.08	365	Continue to monitor within EOI of ES2 12/09/2016	Outstanding
C510-RP11023A	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-22	03/06/2014	28/06/2016	-0.96	120	-2.19	180	-0.45	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11024A	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-22	03/06/2014	28/06/2016	1.31	120	-0.68	180	-0.48	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11025A	Block 110	S11005	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-22	03/06/2014	28/06/2016	-1.64	120	-2.62	180	-0.17	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11026	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_RCW_Enlargement_Adv-71	07/05/2014	28/06/2016	-0.60	120	-1.72	180	0.31	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11027	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_RCW_Enlargement_Adv-71	07/05/2014	28/06/2016	0.99	120	-0.64	180	0.19	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11028A	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-18	02/06/2014	28/06/2016	0.30	120	-1.09	180	-0.23	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11029	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_RCW_Enlargement_Adv-71	07/05/2014	28/06/2016	1.71	120	-0.24	180	0.01	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11030	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-1.01	120	-1.78	180	-0.37	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11031	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	2.72	120	0.37	180	0.21	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11032	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-0.86	120	-1.91	180	-0.44	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed
C510-RP11033	Block 110	S11006	External	Automated	RP	3D Geodetic prism	Capel House	LIV_CP9_Enlargement_Adv-32	23/08/2014	28/06/2016	-5.22	120	-4.07	181	0.49	365	1 Year trend below 2mm/yr requirement. 28/06/2016	Proposed

Learning Legacy

Figure 7 - Supplementary Evidence - RP (with Offsets) Monitoring Sensor Settlement Status and Location Plan

- Legend
- Sensor has not met any trend requirements
 - Sensor trend for 120 days is 2.0mm - 3.5mm/yr
 - Sensor trend for 120 days is below 2.0mm/yr
 - Sensor trend for 180 days is below 2.0mm/yr
 - Sensor trend for 365 days is below 2.0mm/yr



8 **Appendix 2**

Appendix 2 includes the Graphs, Tables, Supplementary Evidence and Figures that were used as evidence to agree decommissioning in Revision 3 of Block 10 Close out Report.

Learning Legacy Document

Table 2 - Block 10 Decommissioning Status Tracker

< 2.0 mm GREEN	< 3.5 mm AMBER	> 3.5 mm RED
----------------	----------------	--------------

C510 Sensor Name	Block	Section	Int / Ext	Measurement Type	Sensor Type	Sensor Description	Asset/Location	ZO/Last Primary Layer Construction	Last Construction Date	Latest Surveyed Date	AVERAGE SETTLEMENT TRENDS						Ceased Date	General Comment	Decommissioning Status
											120 Days	120 Day Calculation Period	180 Days	180 Day Calculation Period	365 Days	365 Day Calculation Period			
C510-LB11022	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-0.78	157	-0.34	260	-0.97	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11023	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-3.26	176	-2.34	260	-1.40	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11024	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-4.31	133	-2.59	260	-2.13	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11025	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-0.22	133	0.05	260	-2.48	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11026	Block 110	S11006	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-4.32	133	-3.74	260	-3.79	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11027	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-3.60	133	-3.42	260	-3.68	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11028	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-2.74	133	-3.37	260	-3.42	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11029	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-0.91	133	-2.57	260	-2.74	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11032	Block 110	S11001	External	Manual	LB	BRE	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-0.57	125	-1.39	184	-2.52	367	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LC11028	Block 110	S11006	External	Manual	LC	Invar Scale	85 London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.24	176	-2.24	260	-0.99	372	Continue to monitor as 85 London Wall has a Settlement Deed	Outstanding	
C510-LB11030	Block 110	S11001:S11006	External	Manual	LB	BRE	53 New Broad St	LIV_VD1_Enlargement_Adv-13	30/05/2014	05/05/2017	-1.02	130	-0.52	186	-1.97	367	2mm Per annum specification met	Proposed	
C510-LC11023	Block 110	S11005	External	Manual	LC	Invar Scale	53 New Broad St	LIV_RCW_Enlargement_Adv-71	07/05/2014	19/05/2016	0.78	157	-0.90	260	-1.96	372	2mm Per annum specification met	Proposed	
C510-LC11024	Block 110	S11005	External	Manual	LC	Invar Scale	53 New Broad St	LIV_RCW_Enlargement_Adv-50	02/05/2014	05/05/2017	-1.34	157	-1.34	260	-0.82	372	2mm Per annum specification met	Proposed	
C510-LC11025	Block 110	S11006	External	Manual	LC	Invar Scale	53 New Broad St	LIV_RCW_Enlargement_Adv-47	01/05/2014	05/05/2017	-0.61	157	-0.61	260	-0.81	372	2mm Per annum specification met	Proposed	
C510-LC11026	Block 110	S11006	External	Manual	LC	Invar Scale	53 New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	05/05/2017	-0.54	176	-0.80	260	-0.94	372	2mm Per annum specification met	Proposed	
C510-LC11027	Block 110	S11006	External	Manual	LC	Invar Scale	53 New Broad St	LIV_RCW_Enlargement_Adv-25	26/04/2014	05/05/2017	-1.20	176	-1.03	260	-0.87	372	2mm Per annum specification met	Proposed	
C510-LC11029	Block 110	S11001	External	Manual	LC	Invar Scale	53 New Broad St	LIV_RCW_Enlargement_Adv-55	03/05/2014	05/05/2017	-0.04	165	-0.62	260	-2.01	372	6 month monitoring specification met	Proposed	
C510-LC11030	Block 110	S11001	External	Manual	LC	Invar Scale	53 New Broad St	LIV_VD1_Enlargement_Adv-18	02/06/2014	05/05/2017	-0.05	130	-0.71	186	-2.07	367	6 month monitoring specification met	Proposed	
C510-LP13001	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-14	30/05/2014	05/05/2017	-1.36	170	-1.89	183	-2.49	395	Stable 6 months trend	Proposed	
C510-LP13002	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-18	02/06/2014	05/05/2017	-1.03	170	-1.14	183	-1.61	443	2mm Per annum specification met	Proposed	
C510-LP13003	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-21	03/06/2014	05/05/2017	-1.43	170	-1.84	183	-1.67	443	2mm Per annum specification met	Proposed	
C510-LP13004	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-22	03/06/2014	05/05/2017	-1.25	170	-1.19	183	-1.25	443	2mm Per annum specification met	Proposed	
C510-LP13005	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	05/05/2017	-0.99	170	-1.01	183	-1.11	443	2mm Per annum specification met	Proposed	
C510-LP13006	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	15/02/2017	-3.51	182	-3.51	182	-1.55	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13007	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-23	04/06/2014	15/02/2017	-3.05	182	-3.05	182	-1.38	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13008	Block 110	S11001	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-21	03/06/2014	15/02/2017	-2.70	182	-2.70	182	-1.25	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13009	Block 110	S11001:S11002	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-17	01/06/2014	15/02/2017	-2.70	182	-2.70	182	-1.05	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13010	Block 110	S11001:S11002	External	Manual	LP	Road Stud	New Broad St	LIV_VD1_Enlargement_Adv-9	30/05/2014	15/02/2017	-2.36	182	-2.36	182	-0.95	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13011	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_RCW_Enlargement_Adv-71	07/05/2014	15/02/2017	-1.98	182	-1.98	182	-0.86	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13012	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_RCW_Enlargement_Adv-71	07/05/2014	15/02/2017	-2.29	182	-2.29	182	-0.85	410	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13013	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.69	182	-2.69	182	-0.86	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13014	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.40	182	-2.40	182	-0.74	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13015	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.60	182	-1.60	182	-0.81	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13016	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.51	182	-2.51	182	-1.04	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13017	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.68	182	-2.68	182	-1.20	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13018	Block 110	S11002	External	Manual	LP	Road Stud	New Broad St	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.14	182	-2.14	182	-0.90	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13019	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.69	182	-1.69	182	-2.07	429	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13020	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-2.66	182	-2.66	182	-0.91	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13021	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.77	182	-1.77	182	-0.61	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13022	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.11	182	-1.11	182	-0.62	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13023	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.43	182	-1.43	182	-0.58	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13024	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.14	182	-1.14	182	-0.74	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13025	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.17	182	-1.17	182	-1.07	396	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13026	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-3.14	182	-3.14	182	-1.64	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13027	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.03	182	-1.08	182	-0.57	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13028	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.14	182	-1.14	182	-0.75	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13029	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	19/05/2016	-1.93	157	-0.64	260	-2.51	372	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13030	Block 110	S11003	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.34	182	-1.34	182	-1.27	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13031	Block 110	S11003:S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-0.48	182	-0.48	182	-0.85	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13032	Block 110	S11003:S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-0.88	182	-0.88	182	-0.60	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13033	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-0.88	182	-0.88	182	-0.66	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13034	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-0.97	182	-0.97	182	-0.84	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13035	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.43	182	-1.43	182	-1.01	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13036	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	15/02/2017	-1.17	182	-1.17	182	-1.25	448	Agreed to cease CTC meeting 21.03.2017	Proposed	
C510-LP13037	Block 110	S11004	External	Manual	LP	Road Stud	London Wall	LIV_CP9_Enlargement_Adv-32	23/08/2014	09/0									

Table 2 - Block 10 Decommissioning Status Tracker

< 2.0 mm GREEN	< 3.5 mm AMBER	> 3.5 mm RED
----------------	----------------	--------------

													AVERAGE SETTLEMENT TREND					
C510-RP11021A	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-19	02/06/2014	28/04/2017	-0.07	120	-1.06	180	-0.56	365	Stable Trends- 6 Months post construction monitoring specification complete	Proposed
C510-RP11022	Block 110	S11004	External	Automated	RP	3D Geodetic prism	Capel House	LIV_VD1_Enlargement_Adv-18	02/06/2014	11/09/2013	N/A		N/A		N/A		Trends not applicable- Not monitored since 2013	Proposed
C510-TB11003A	Block 110		External	Automated	TB	Tiltmeter-Biaxial	53 New Broad St	LIV_VD1_Enlargement_Adv-12	30/05/2014	18/05/2017	-0.12	120	-0.13	180	-0.08	365	Stable Trends- 6 Months post construction monitoring specification complete	Proposed
C510-TB11003B											0.16		0.15		0.07			
C510-TB11004A	Block 110		External	Automated	TB	Tiltmeter-Biaxial	85 London Wall	LIV_CP9_Enlargement_Adv-32	30/05/2014	18/05/2017	0.16	120	0.18	180	0.07	365	Stable Trends- 6 Months post construction monitoring specification complete	Proposed
C510-TB11004B											-1.16		0.96		-0.42			
C510-XR11001-4.5m	Block 110	XR11001	Inground	Manual	XR	Extensometer-Rod	New Broad St	LIV_TBM-West-RC_Pilot_Adv-4008	12/03/2015	22/05/2017	-2.71	122	-1.11	192	-1.99	374	All sensors have met the 6 month monitoring specification- Yearly trends also very stable	Proposed
C510-XR11001-9m											-2.81		-1.59		-2.31			
C510-XR11001-14m											-2.27		-1.64		-2.38			
C510-XR11001-18.3m											-2.76		-1.05		-2.00			
C510-XR11001-23.8m											-2.22		-0.74		-1.94			
C510-XR11001-26.8m	-1.14	-0.40	-1.12															

Learning Legacy Document

Figure 6- LP & XR Monitoring Sensor Decommissioning Status and Location Plan

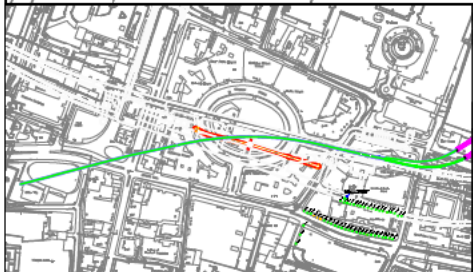
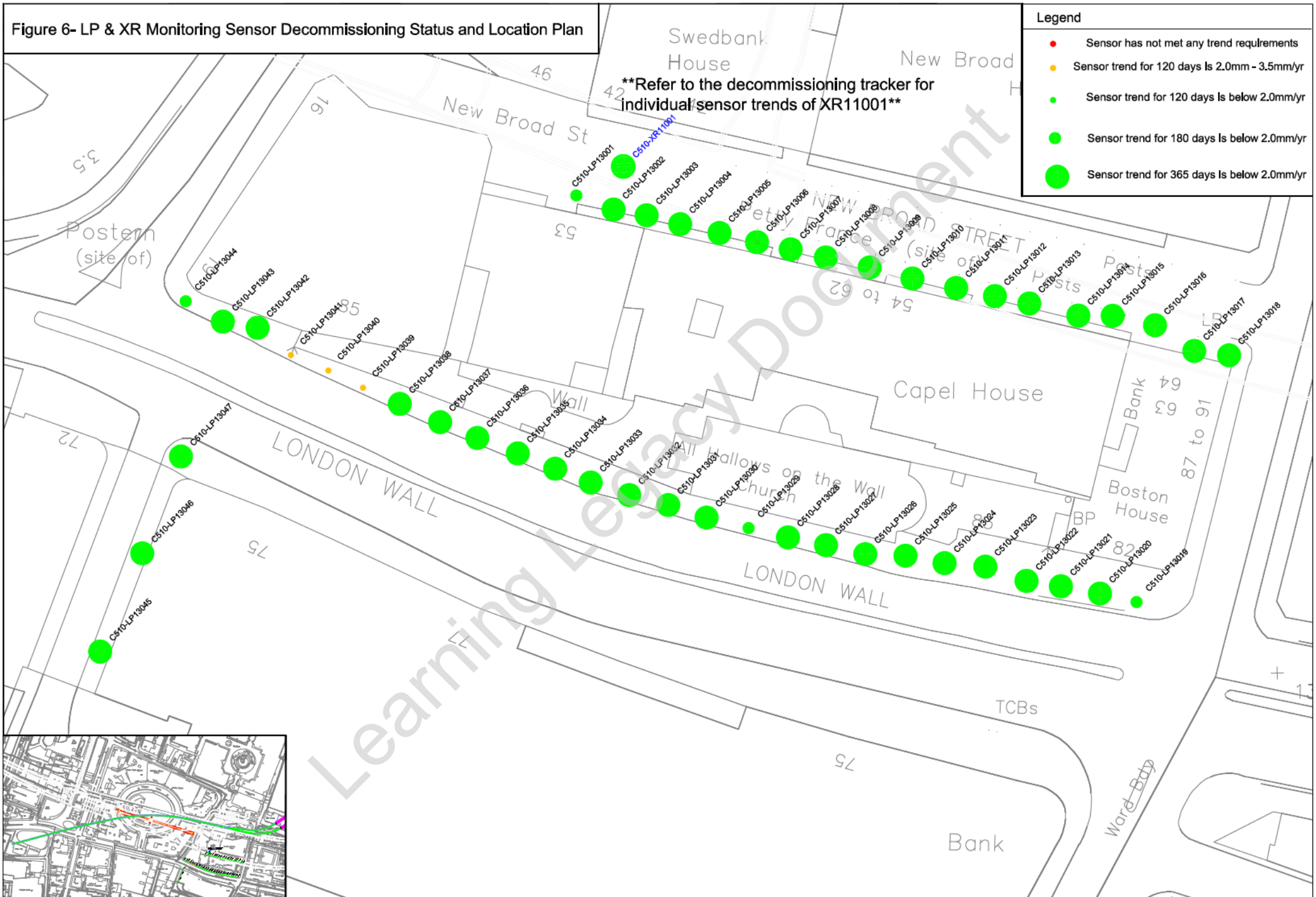
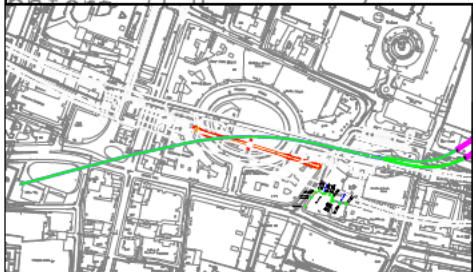
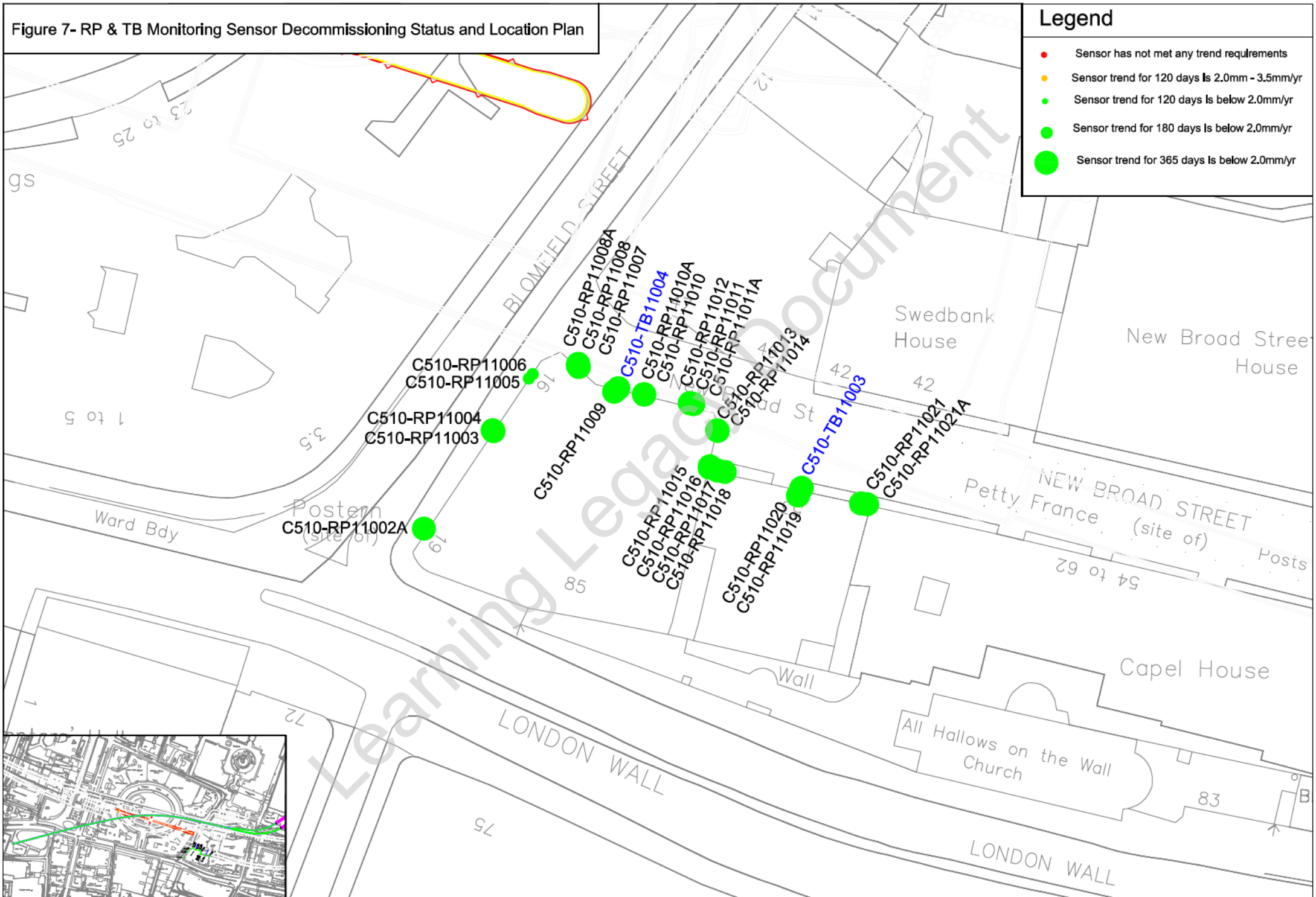


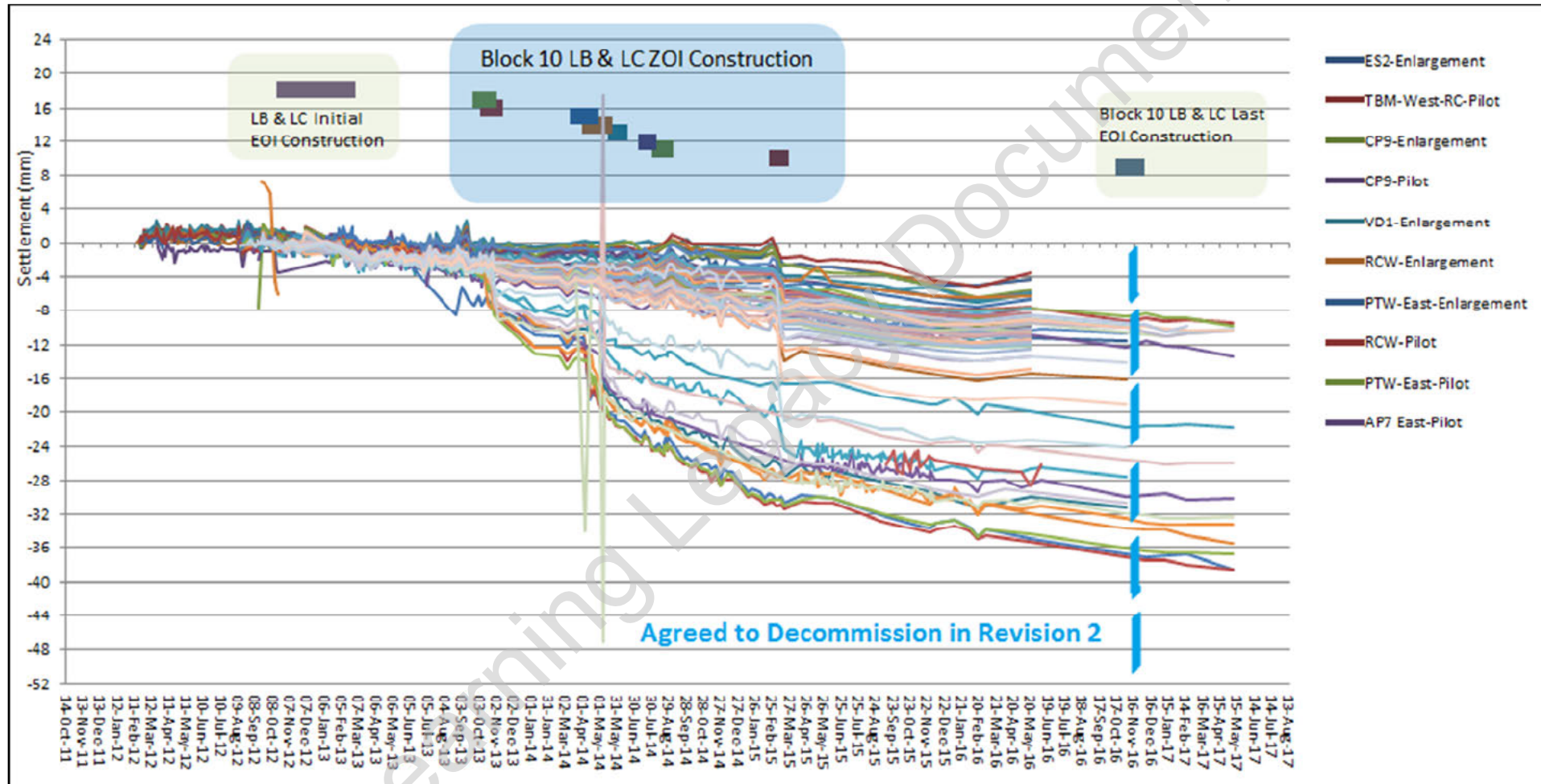
Figure 7- RP & TB Monitoring Sensor Decommissioning Status and Location Plan

Legend

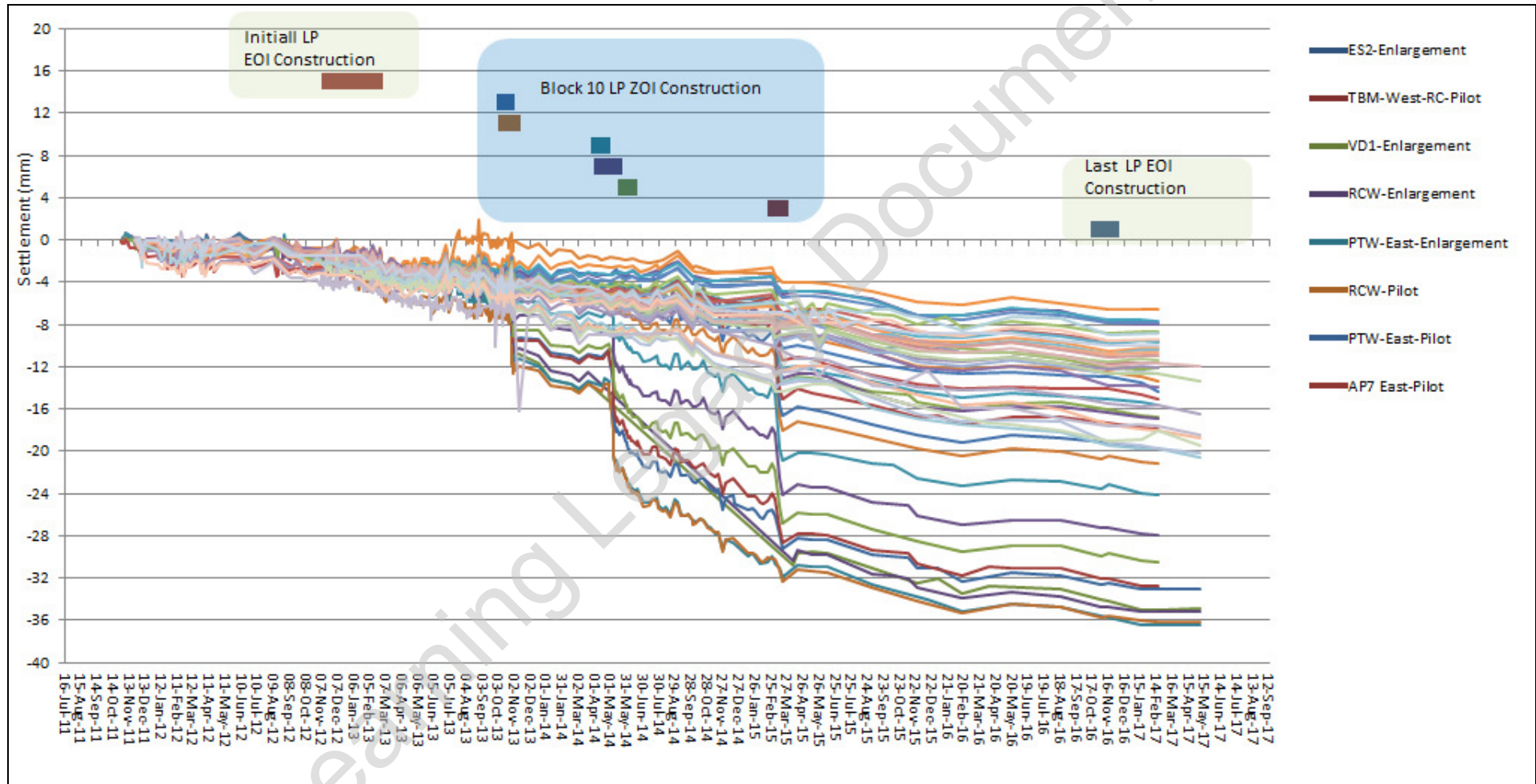
- Sensor has not met any trend requirements
- Sensor trend for 120 days is 2.0mm - 3.5mm/yr
- Sensor trend for 120 days is below 2.0mm/yr
- Sensor trend for 180 days is below 2.0mm/yr
- Sensor trend for 365 days is below 2.0mm/yr



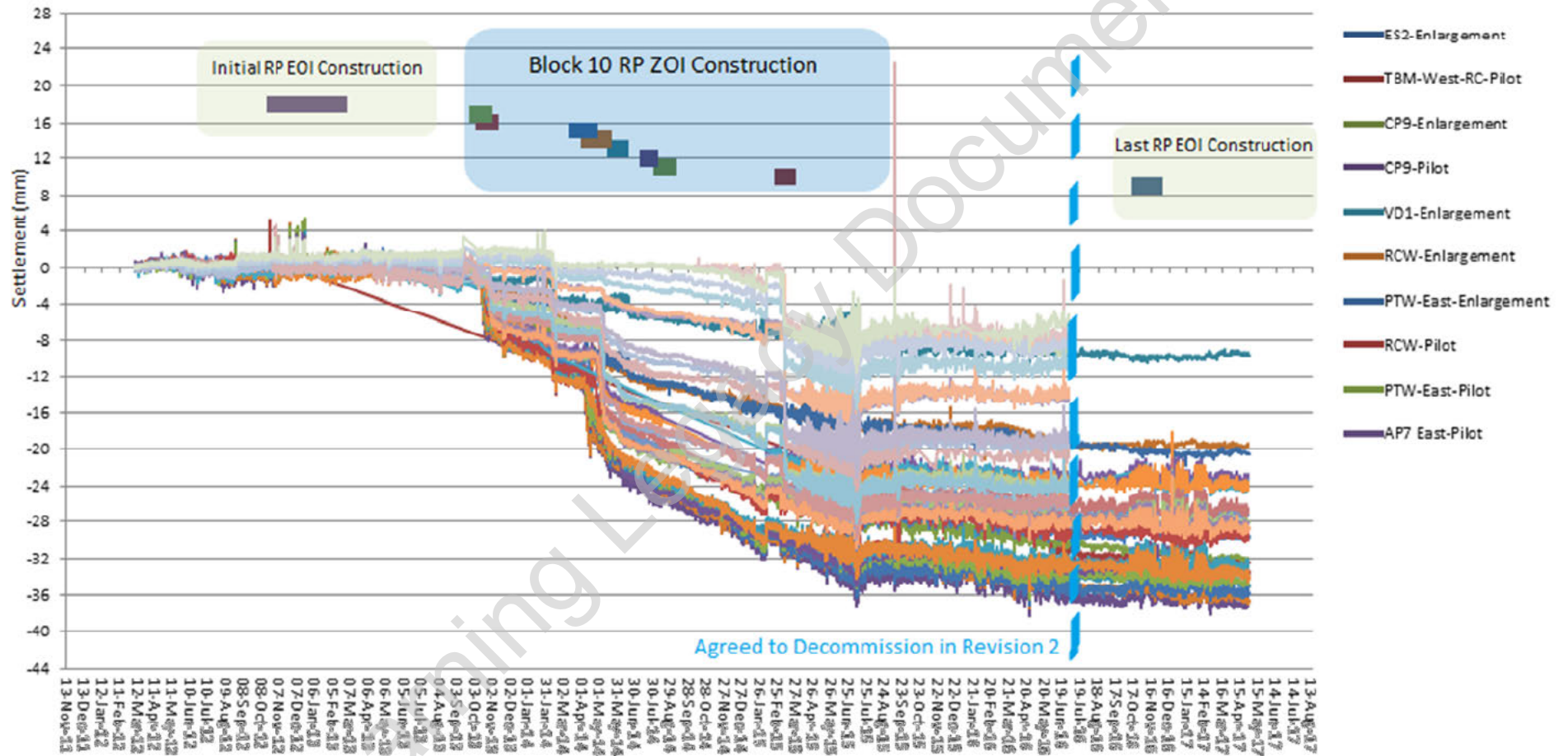
7.10 All Block 10 Building (BRE & LC) Manual Monitoring History in Relation to Construction (Revision 3)



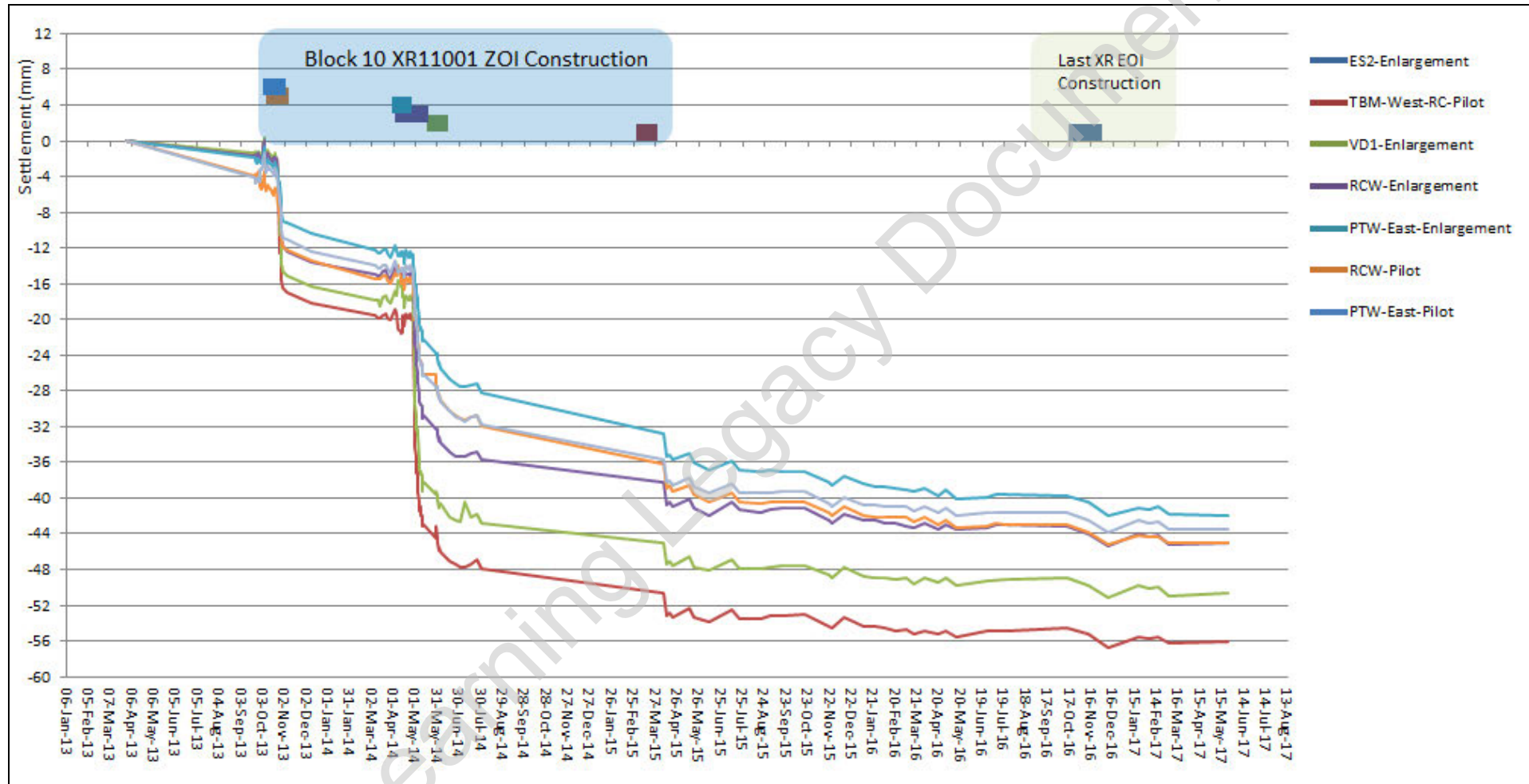
7.11 All Block 10 Road Stud (LP) Manual Monitoring History in Relation to Construction (Revision 3)



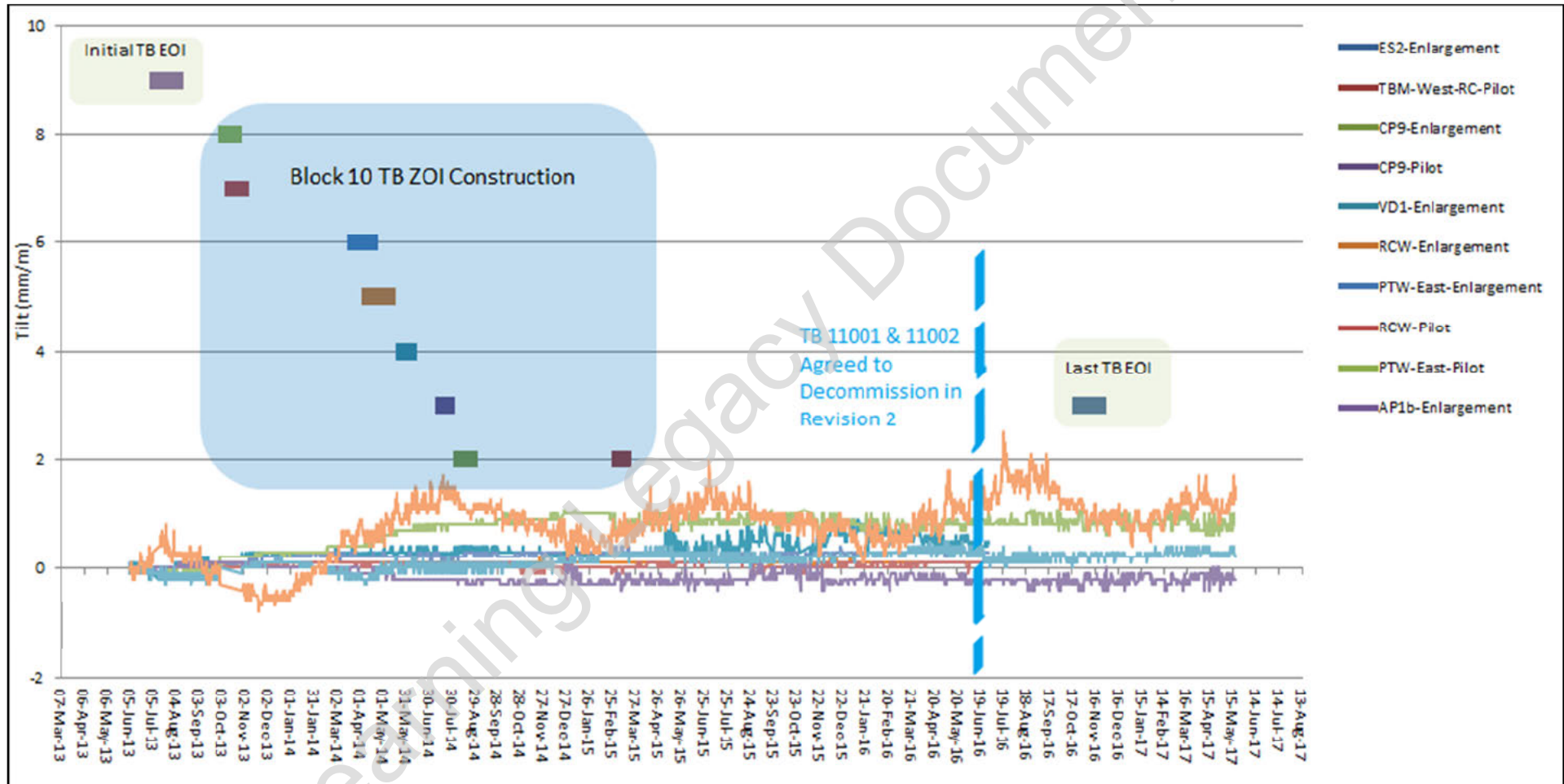
7.12 All Block 10 Building Prism (RP) Automated Monitoring History in Relation to Construction (Revision 3)



7.13 C510-XR11001 Manual Monitoring History in Relation to Construction (Revision 3)



7.14 Tiltmeter (TB) Monitoring History in Relation to Construction (Revision 3)



7.15 Supplementary Evidence for Decommissioning (Revision 3)

Tiltmeter Automated Monitoring Data

Includes: C510-TB11001-04

Reason for proposed decommissioning:

In revision 2 of Block 10 close out report the Tiltmeter data was presented as seen below in Figure 4. The data was very noisy and since then has been cleaned by a Soldata technician. The noise does not affect the overall stability of the sensor or the judgment made to decommission.

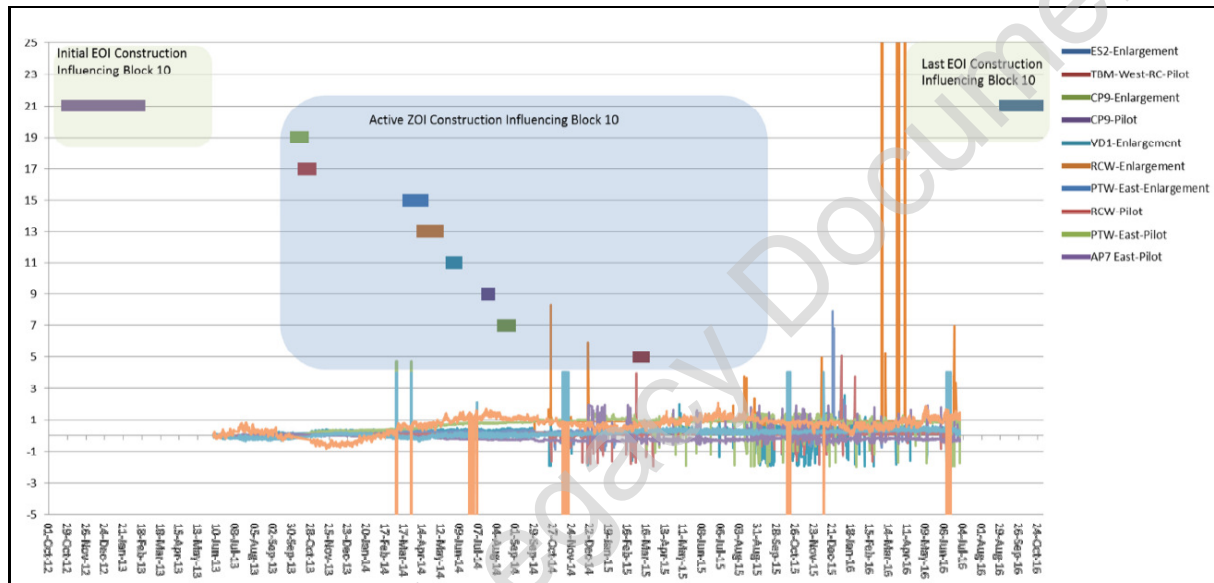


Figure 5 - Tiltmeter Data before being cleaned by Soldata