



# C510 – Whitechapel and Liverpool Street Station Tunnels

## Instrumentation and Monitoring Close Out Report Block 08 Liverpool Street CRL Document Number: C510-BBM-C2-RGN-C101-50228 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:
1.0	16/11/2016	[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:

		<b>Crossrail Review and Acceptance Decal</b>	
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	
[REDACTED]			Date: 06/03/17
<small>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.</small>			

Document Revision History		
Revision	Date	Purpose
1.0	06/10/2016	For approval

## TABLE OF CONTENTS

<b>1</b>	<b>Purpose of Close out Report .....</b>	<b>3</b>
<b>2</b>	<b>Scope of Monitoring Assessment for Close Out .....</b>	<b>4</b>
<b>3</b>	<b>Close Out Report Block Description and Location Plan .....</b>	<b>5</b>
3.1	<b>Block 08 Location .....</b>	<b>5</b>
3.2	<b>Block 08 Description.....</b>	<b>6</b>
<b>4</b>	<b>Construction Programme Influencing Block 08 .....</b>	<b>7</b>
4.1.1	<b>Tunnel Advances Affecting Block 08.....</b>	<b>9</b>
<b>5</b>	<b>Monitoring Assessment of Block 08 .....</b>	<b>10</b>
5.1	<b>Time Graphs Monitoring Full History and Construction Durations .....</b>	<b>10</b>
5.2	<b>Decommissioning Status Tracker .....</b>	<b>16</b>
5.3	<b>Supplementary Evidence for Decommissioning.....</b>	<b>19</b>
5.4	<b>Monitoring sensor Location Plan and Decommissioning Status .....</b>	<b>22</b>
<b>6</b>	<b>Decommissioning Recommendations .....</b>	<b>26</b>

## Tables and Figures

<i>Figure 1-</i>	<i>Liverpool St General Location Plan - including Block 08 monitoring area .....</i>	<i>5</i>
<i>Figure 2 -</i>	<i>Block 08 EOI Constructions.....</i>	<i>8</i>
<i>Figure 3 –</i>	<i>C502 Site Obstruction.....</i>	<i>19</i>
<i>Figure 4-</i>	<i>C502 site hoarding impeding XR10801 .....</i>	<i>20</i>
<i>Figure 5-</i>	<i>Block 08 C510-XR10801 Flooding - Old Broad St .....</i>	<i>21</i>
<i>Figure 6-</i>	<i>Pavement slab replacement- Corner of Blomfield Street and Eldon Street .....</i>	<i>21</i>
<i>Figure 7 -</i>	<i>LP and XR Monitoring Sensor Settlement Status and Location Plan.....</i>	<i>23</i>
<i>Figure 8 -</i>	<i>LB and TB Monitoring Sensor Settlement Status and Location Plan.....</i>	<i>24</i>
<i>Figure 9 -</i>	<i>RP Monitoring Sensor Settlement Status and Location Plan .....</i>	<i>25</i>
<i>Graph 1-</i>	<i>All Block Road Studs (LP) Manual Monitoring History in Relation to Construction .....</i>	<i>11</i>
<i>Graph 2 -</i>	<i>All Block 08 BREs (LB) Manual Monitoring History in Relation to Construction .....</i>	<i>12</i>
<i>Graph 3-</i>	<i>All Block 08 Geodetic Prisms (RP) Manual Monitoring History in Relation to Construction .....</i>	<i>13</i>
<i>Graph 4 -</i>	<i>Tiltmeter C510-TB10801 (TB) Manual Monitoring History in Relation to Construction.....</i>	<i>14</i>
<i>Graph 5 -</i>	<i>Extensometer C510-XR10801 (XR) Manual Monitoring History in Relation to Construction .....</i>	<i>15</i>
<i>Table 1-</i>	<i>Tunnel Advances Affecting Block 08.....</i>	<i>9</i>
<i>Table 2 -</i>	<i>Decommissioning Tracker.....</i>	<i>18</i>

## 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 08 of Crossrails'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.

**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 08 Location

Figure 1 shows the Liverpool St general location plan, C510 tunnel construction and where Block 08 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 16inch cast iron water mains (critical assets) are located on Bloomfield St and Eldon St (south side) within close proximity to Block 08. Other utilities surrounding Block 08 include: brick sewers, as well as gas and water mains of various materials. 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.

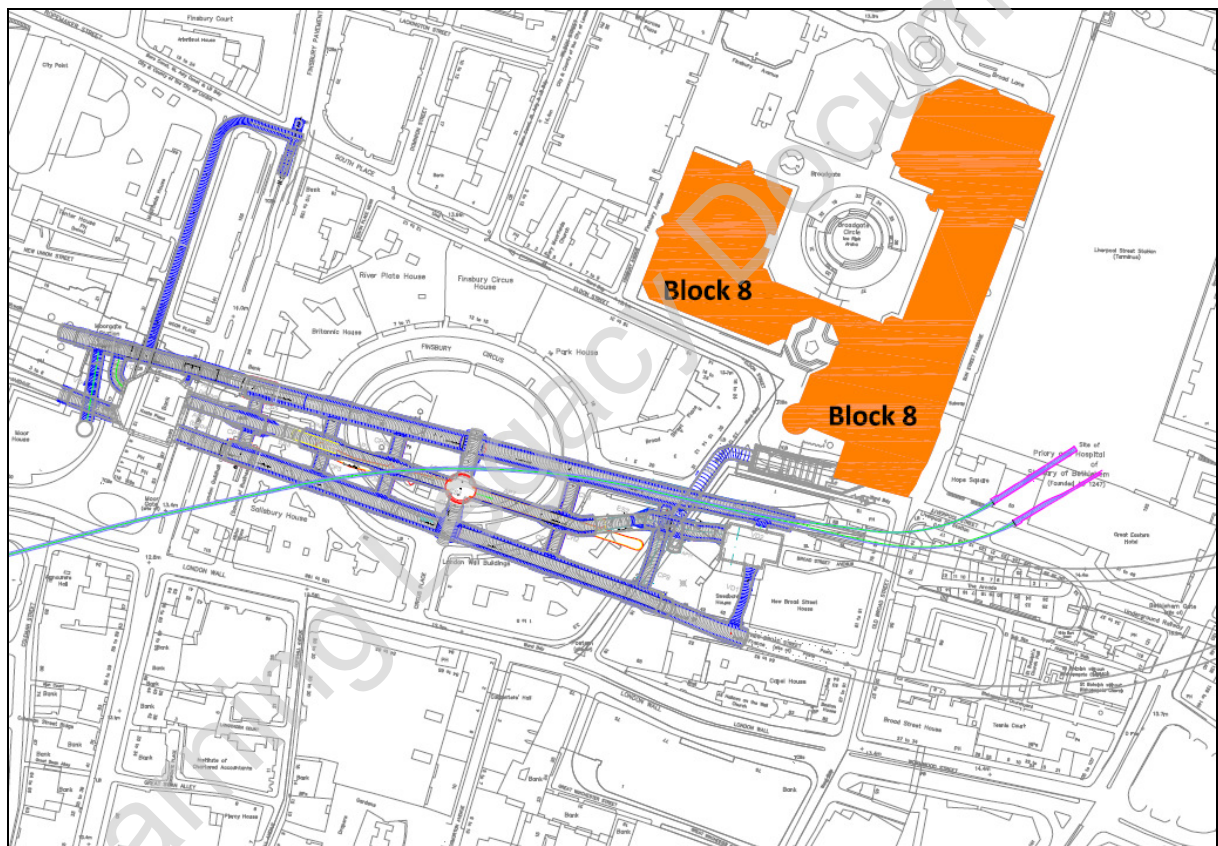


Figure 1- Liverpool St General Location Plan - including Block 08 monitoring area

### 3.2 Block 08 Description

Block 08 is located between Sun Street Passage and Finsbury Ave. The block occupies The Octagon Arcade (UBS), Eldon St, Blomfield St and a small area of C502 Broadgate Site. Block 08 contains the following types of monitoring sensors:

- Road Studs (LP) - manual monitoring
- Building (BREs) - manual monitoring
- Building Prism monitoring (RP) – automated monitoring
- Extensometer (XR) – manual monitoring
- Tiltmeter (TB) – automated

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

Block 08 Installation Report References:

- Instrumentation C510-XR10801- Liverpool St.-Extensometer  
CRL Document Number: C510-BBM-C2-RGN-C101-50105
- Monitoring Installation Report LIV-LB08 – Liverpool Street  
CRL Document Number: C510-BBM-C2-RGN-C101-50157
- Installation Report- UBS Building- Block 8, Liverpool Street  
CRL Document Number: C510-BBM-C2-RGN-C101-50009
- Monitoring Installation Report LIV-LP8 Liverpool Street, Sun Street Passage  
CRL Document Number: C510-BBM-G-RGN-C101-50004

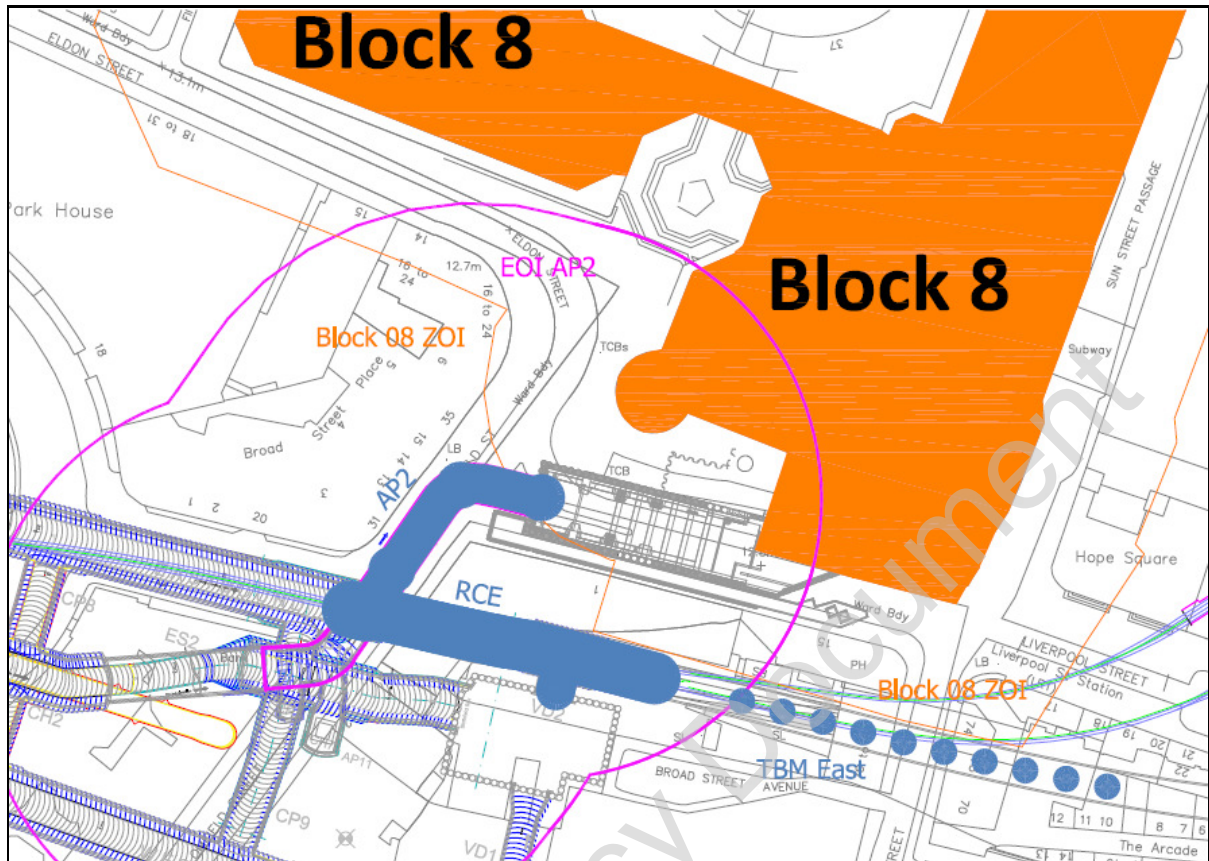
The Settlement Contour Drawing (C122-OVE-C2-DDA-CR001\_Z-21313) predicts the Block 08 area to experience approximately 1-40mm of settlement.

## 4 Construction Programme Influencing Block 08

Extent of Influence (EOI) monitoring areas were established to record ground movements in relation to Crossrail 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 08, a ZOI area was established by giving each monitoring sensor a radius of 2.0 x tunnel diameter. This area was then used to determine all the mining advances that occurred within its boundary, *Figure 2* shows the ZOI boundary (orange outline). As the only construction within the ZOI of Block 08 was AP2, the EOI will be referenced to assist the analysis of construction against monitoring data. *Figure 2* highlights the tunnel constructions (blue colour) within the Block 08 EOI. Tunnel advance start and finish dates will be used in assessment of the monitoring data.



**Figure 2 - Block 08 EOI Constructions**

**N.B.** AP2 EOI is represented in *Figure 2* to display the area of Block 08 affected by AP2 construction.

*Figure 2* shows that the only C510 works within the ZOI for Block 08 is the end of AP2. Therefore, to assist the monitoring analysis of Block 08, the EOI will be referenced against settlement. Due to the depth of AP2, the EOI will be referenced at a 50m radius. The construction advances within the EOI that have the potential to affect Block 08 are listed and summarised in *Table 1*.

The last completed C510 construction which had the potential to affect Block 08 within the ZOI was the AP2 Advance 8 Enlargement, which was completed on the 25<sup>th</sup> of June 2016. The C305 Eastbound TBM construction had the potential to influence Block 08, and is included within the table and the graph to assess the monitoring data. Further evidence for construction dates can be seen in *Table 2*, which lists the latest tunnel advances for each point.

**N.B.** It should be noted that C502 and C503 works may have affected Block 08. Reference should be made to C502 and C503 close out reports for construction dates.



#### 4.1.1 Tunnel Advances Affecting Block 08

The information presented in *Table 1* is used in the monitoring graph (Section 5.1), to show the ground movements in relation to construction. As the only C510 construction within the active ZOI is the end of AP2, the EOI (50m radius) has been referenced to assist in the analysis of the monitoring data against construction.

Tunnel Code	Tunnel Reference	Primary Layer Type	Start Date	End Date	Start Advance	End Advance	ZONE
AP2-Enlargement	AP2	Enlargement	21/06/2016	25/06/2016	8	2	ZOI
AP2-Pilot	AP2	Pilot	08/05/2016	31/05/2016	23	73	EOI
TBM-East-RC-Pilot	TBM-East-RC	Pilot	24/01/2015	31/01/2015	3850	3909	C305
VD2-Enlargement	VD2	Enlargement	17/05/2014	17/05/2014	2	3	EOI
RCE-Enlargement	RCE	Enlargement	31/01/2014	05/03/2014	1	86	EOI
PTE-East-Enlargement	PTE-East	Enlargement	28/01/2014	30/01/2014	164	168	EOI
RCE-Pilot	RCE	Pilot	09/09/2013	26/09/2013	1	51	EOI
PTE-East-Pilot	PTE-East	Pilot	08/09/2013	09/09/2013	117	121	EOI

**Table 1- Tunnel Advances Affecting Block 08**

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 08

Evidence for decommissioning each monitoring sensor is shown through a graph, table (*Table 2*) and a plan. Each element of assessment compliments the other and is used together to determine acceptance of decommissioning. *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.

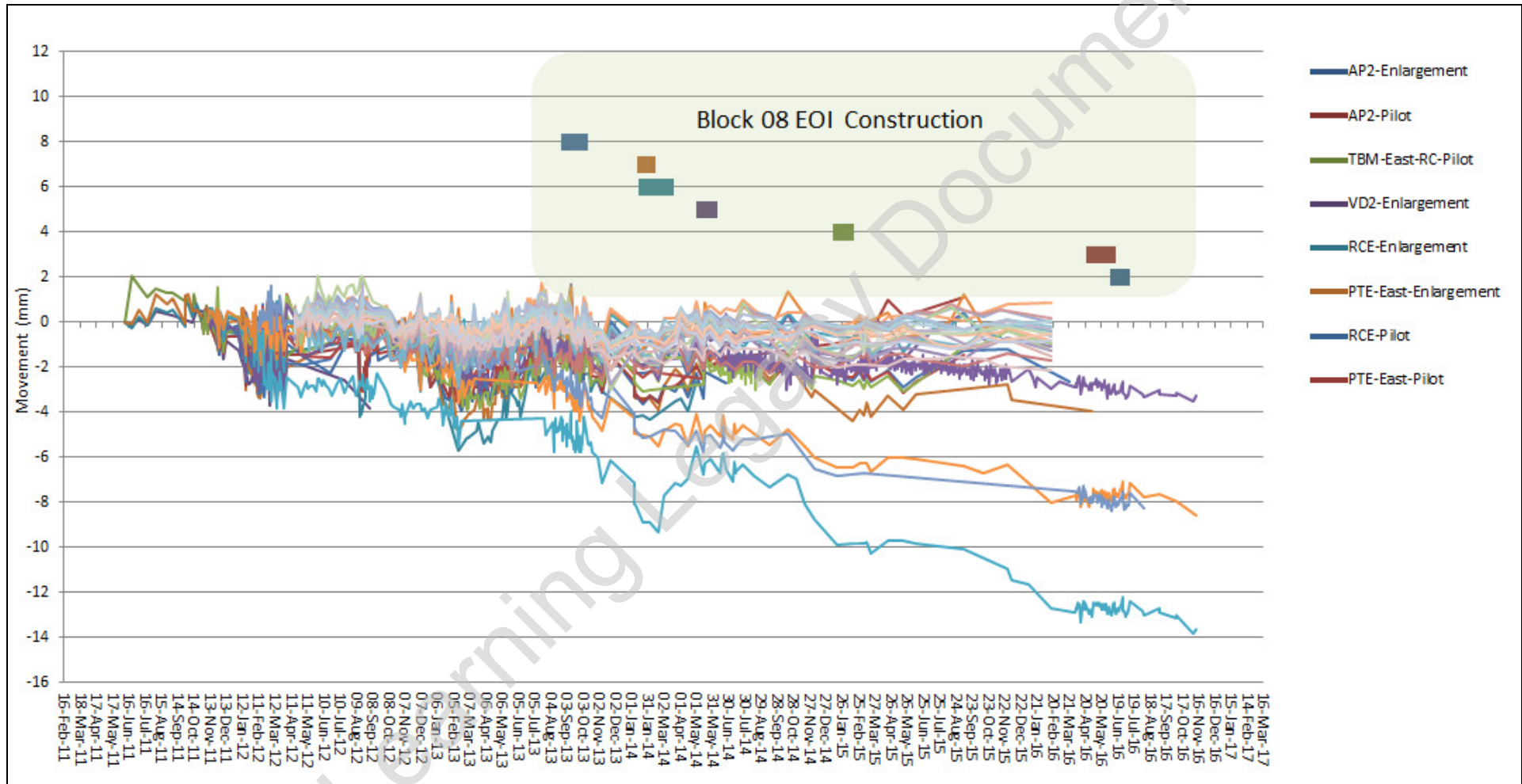
### 5.1 Time Graphs Monitoring Full History and Construction Durations

To assess the movement of Block 08 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:

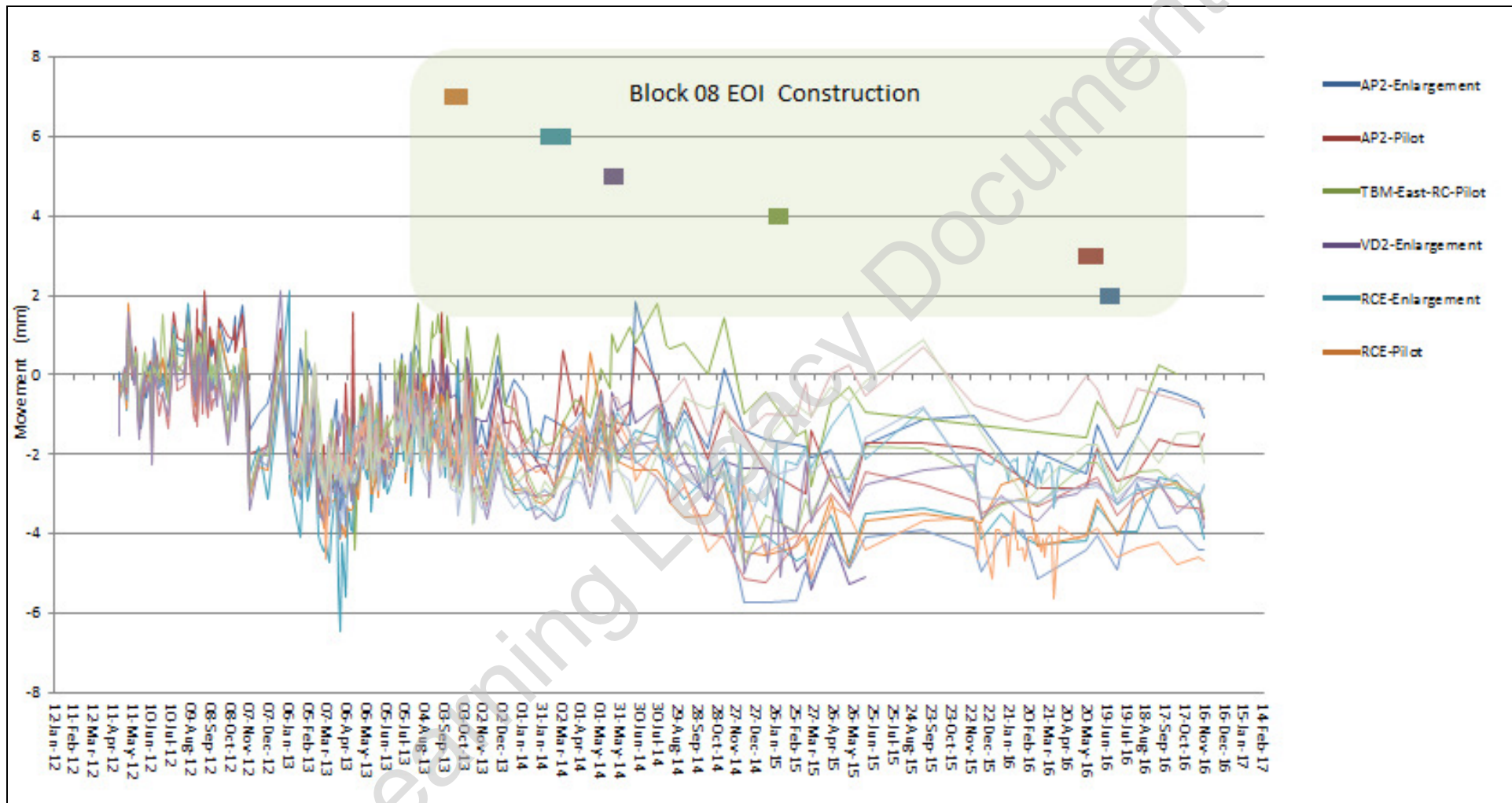
- *Graph 1* –All Block 08 Road Studs (LP) Manual Monitoring History in Relation to Construction
- *Graph 2* –All Block 08 BREs (LB) Manual Monitoring History in Relation to Construction
- *Graph 3* –All Block 08 Geodetic Prisms (RP) Manual Monitoring History in Relation to Construction
- *Graph 4* –Tiltmeter C510-TB10801 (TB) Manual Monitoring History in Relation to Construction
- *Graph 5* –Extensometer C510-XR10801 (XR) Manual Monitoring History in Relation to Construction

Learning Legacy Document

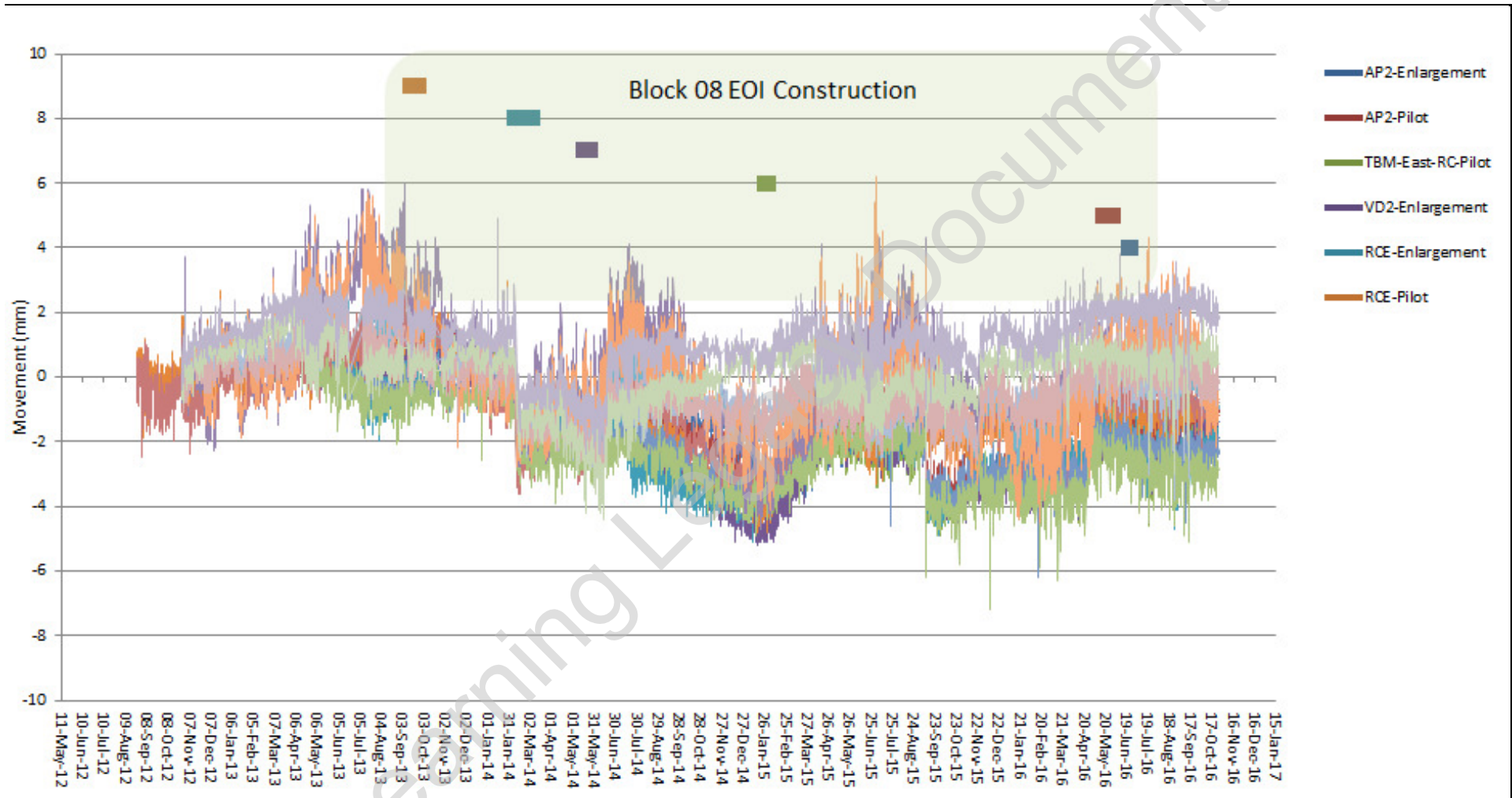
**Graph 1- All Block Road Studs (LP) Manual Monitoring History in Relation to Construction**



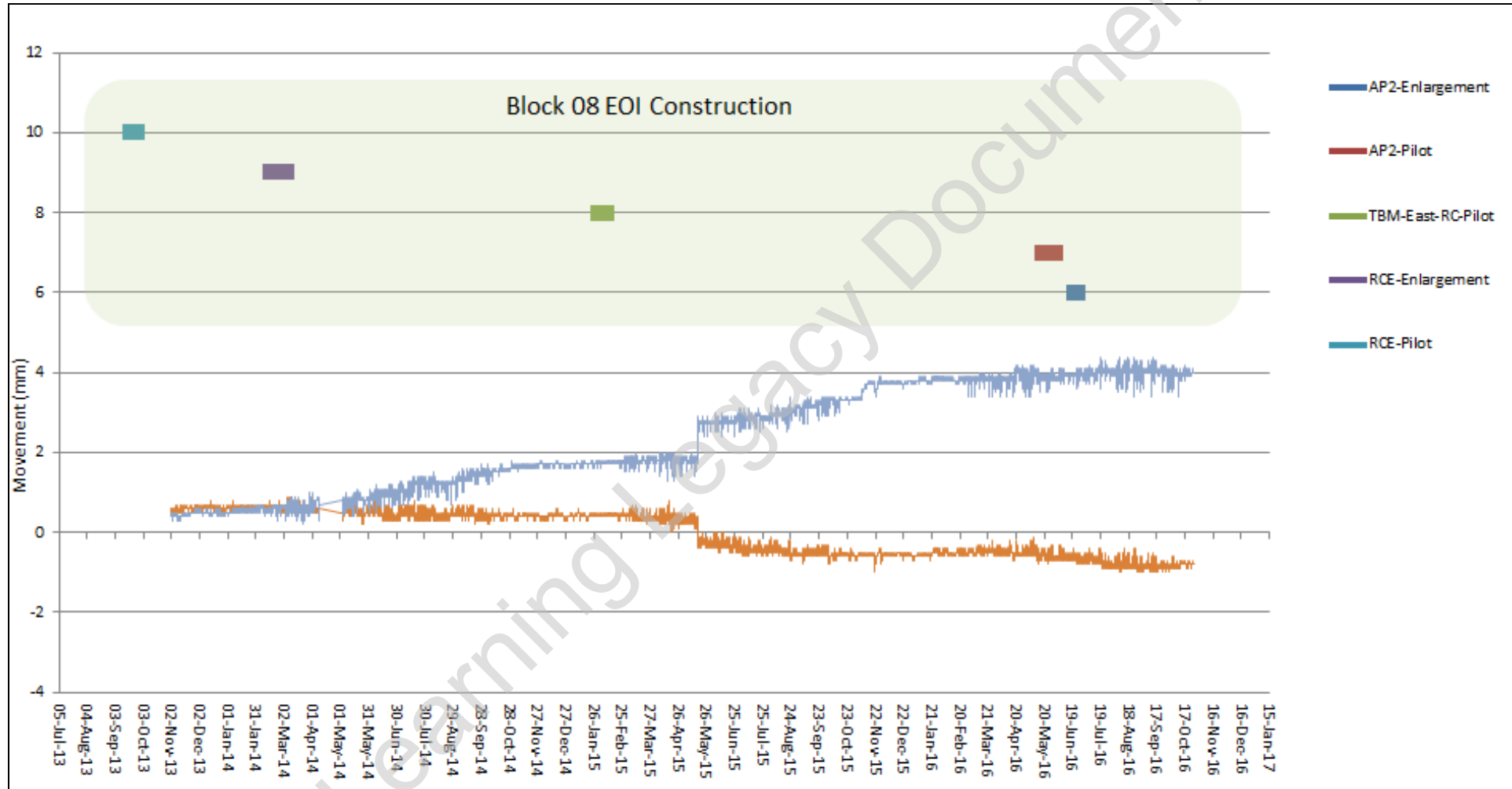
**Graph 2 - All Block 08 BREs (LB) Manual Monitoring History in Relation to Construction**



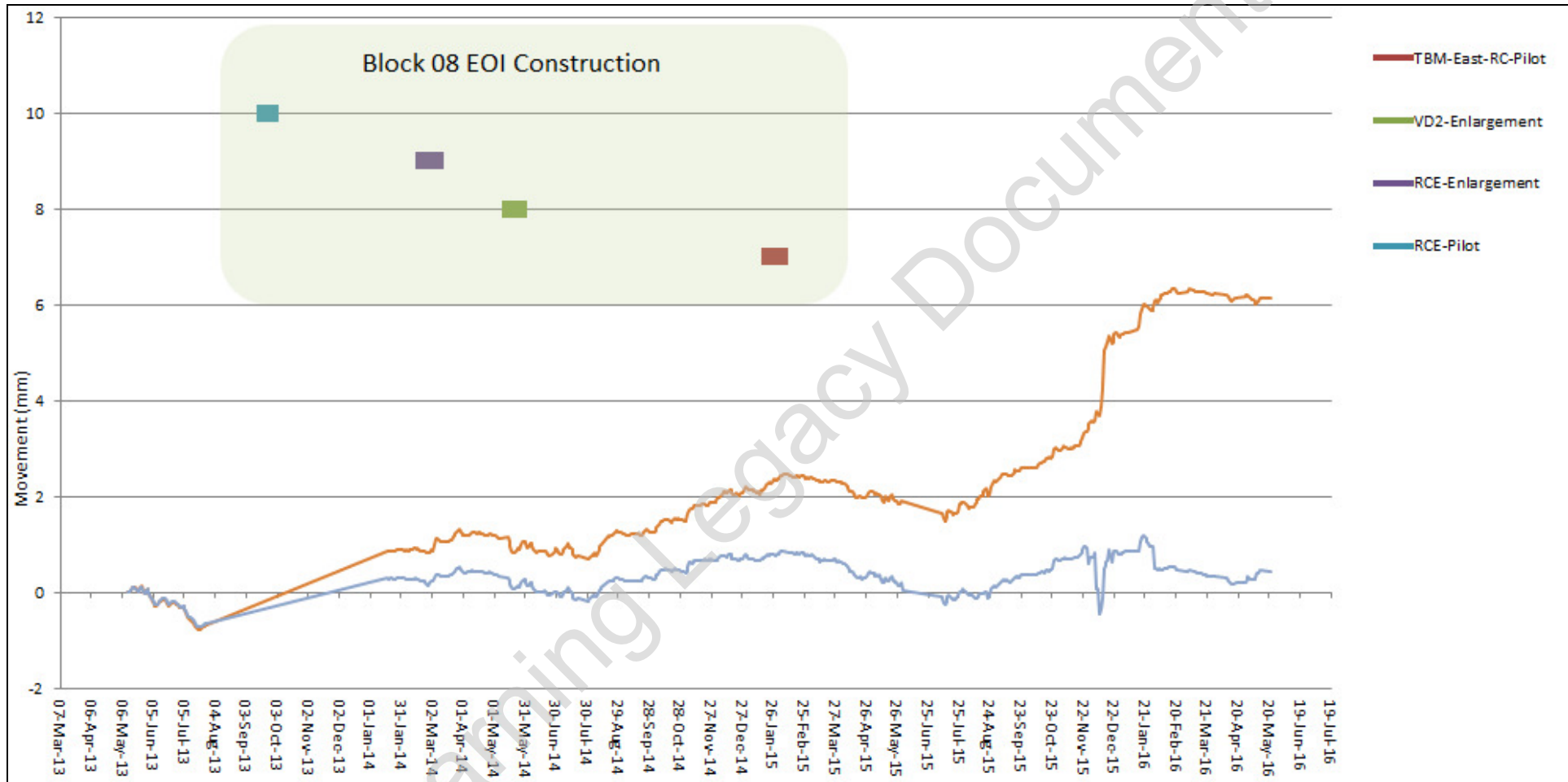
**Graph 3- All Block 08 Geodetic Prisms (RP) Manual Monitoring History in Relation to Construction**



**Graph 4 - Tiltmeter C510-TB10801 (TB) Manual Monitoring History in Relation to Construction**



**Graph 5 - Extensometer C510-XR10801 (XR) Manual Monitoring History in Relation to Construction (relative data only)**



## 5.2 Block 08 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

For each sensor the EOI parameter is used to determine the last completed construction advance that had the potential to cause settlement. All construction tunnel advances that had the potential to affect a sensor through its EOI are listed for each sensor, from the list the latest advance is used as a construction completion 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 16 months (480 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.

### 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 a calculation to determine annual settlement rates using measurements taken across a full year. This measurement period is therefore the desired duration to be used to assess whether long term settlement meets the 2mm per annum specification.



### 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 08. 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.



### 5.3 Supplementary Evidence for Decommissioning

In some cases supplementary evidence will be provided to support the decommissioning evidence.

#### **Road Studs (LP) Manual Monitoring- C502 site obstruction**

**Includes:** C510-LP10801-03, C510-LP10805-10 and C510-LP10812-19

#### **Reasons to propose decommissioning**

Some road studs have not been measured for extended periods of time due to C502 site hoarding. These sensors are no longer accessible and provide no monitoring data in relation to recent construction. *Figure 3* shows the C502 site hoarding occupying the front of The Octagon Arcade along Eldon St and Liverpool St.



**Figure 3 – C502 Site Obstruction**

### **C510-RFI-001014 A2- Block 08 – Octagon Arcade (C122 18087)**

**Includes:** BREs, 3d Geodetic Prisms and Tiltmeter C510-TB10801

C510-RFI-001014 states: We confirm that CEG have agreed that there is sufficient Insar coverage to replace the long term manual monitoring requirements. Please note that this building will be demolished in the near future so there is no requirement to physically decommission the installed I&M (eg. prisms and BRE's).

General - There are no long term monitoring requirements for the automated monitoring, as detailed in the I&M Schedule. Therefore, provided there are no particular discrepancies between the automated and manual monitoring, agreement to decommission the manual monitoring will generally apply to the automated monitoring.

As there is no concerning discrepancies between the manual monitoring of the BREs and the automated 3d Geodetic Prism monitoring it is proposed to agree decommissioning and for Insar to assume responsibility for the remaining monitoring of The Octagon Arcade.

### **Block 08 C510-XR10801- Old Broad Street**

**Includes:** C510-XR10801

In November 2015 it was reported that XR10801 was not producing any data. A Soldata technician inspected the area and found that the sensor was no longer accessible and that the line of sight between the extensometer, the control box and antenna was now impeded by C502 site hoarding. The site hoarding made it difficult to access the sensor and therefore servicing and maintenance was intermittent.



**Figure 4- C502 site hoarding impeding XR10801**

XR10801 experienced flooding during May 2016 and underwent multiple battery replacements; as a result of the flooding the vibration wire interface (AVW200) was damaged. Soldata were instructed not to source a replacement as the sensor was to be decommissioned in the near future, therefore there is no monitoring data since the 3<sup>rd</sup> of May 2016.



**Figure 5- Block 08 C510-XR10801 Flooding - Old Broad St**

It is ostensible that due to flooding and access issues that the XR10801 data is unreliable. The sensor is no longer active and outside the EOI of any current or future C510 construction. It is therefore proposed that decommissioning be agreed.

#### **Block 08 C510-LP10821 & C510-LP10822- Corner of Blomfield Street and Eldon Street**

**Includes:** C510-LP10821 and C510-LP10822



It is evident that the settlement previously recorded on LP10821 and LP10822 is down to historic slab relaying by others or localised settlement not attributable to C510 works. However it is not possible to continue to monitor the existing studs in any case as the pavement is being replaced as shown in *Figure 6*.

**Figure 6- Pavement slab replacement- Corner of Blomfield Street and Eldon Street**

#### 5.4 Monitoring sensor Location Plan and Decommissioning Status

The following plots provide a visual representation of all Block 08 monitoring sensors 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.

- *Figure 7* - LP and XR Monitoring Sensor Settlement Status and Location Plan
- *Figure 8* - LB and TB Monitoring Sensor Settlement Status and Location Plan
- *Figure 9* - RP Monitoring Sensor Settlement Status and Location Plan

Learning Legacy Document

Figure 5- LP and XR Monitoring Sensor Decommissioning 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
- Sensor trend Not Applicable

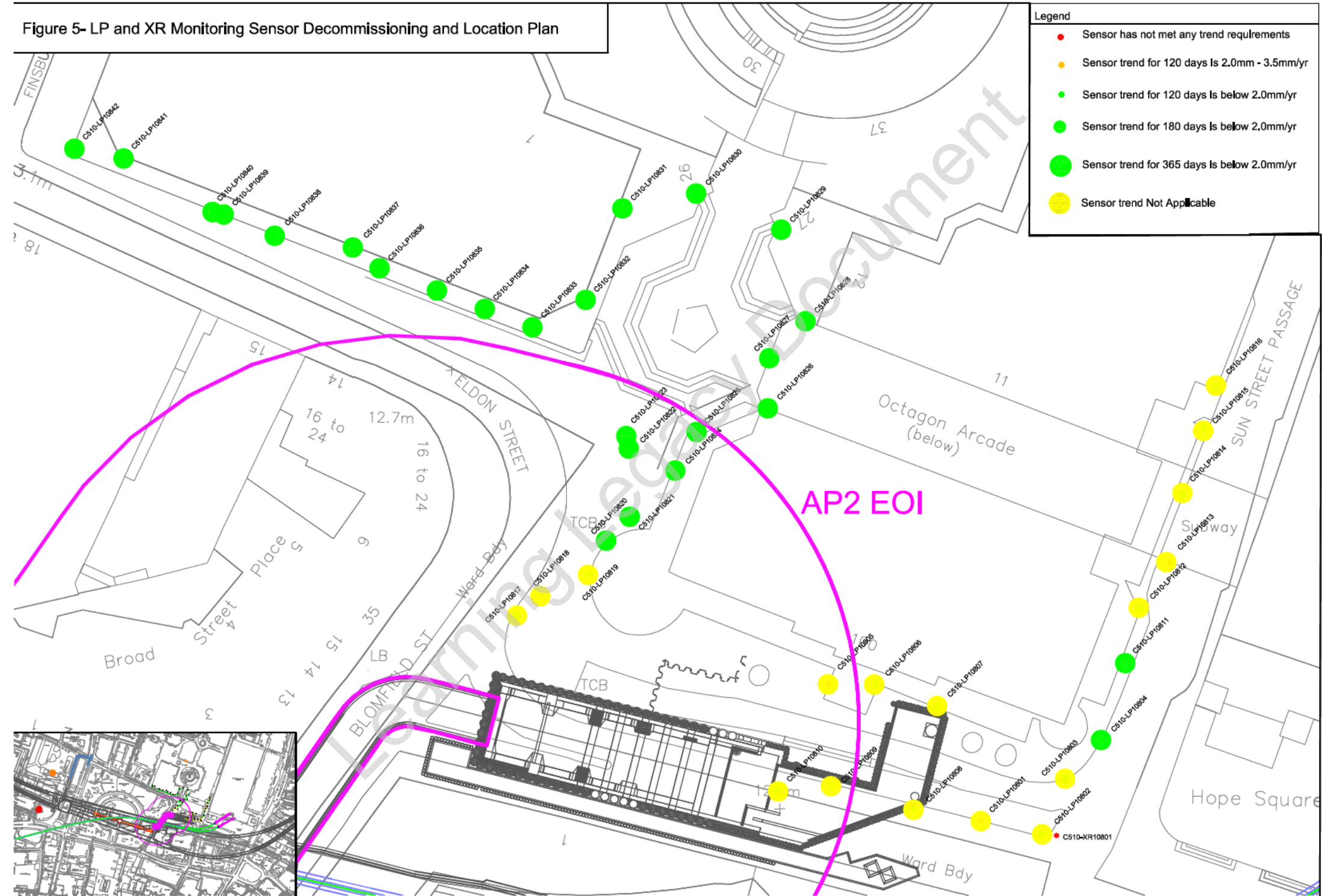


Figure 6- LB and TB Monitoring Sensor Decommissioning Status and Location Plan

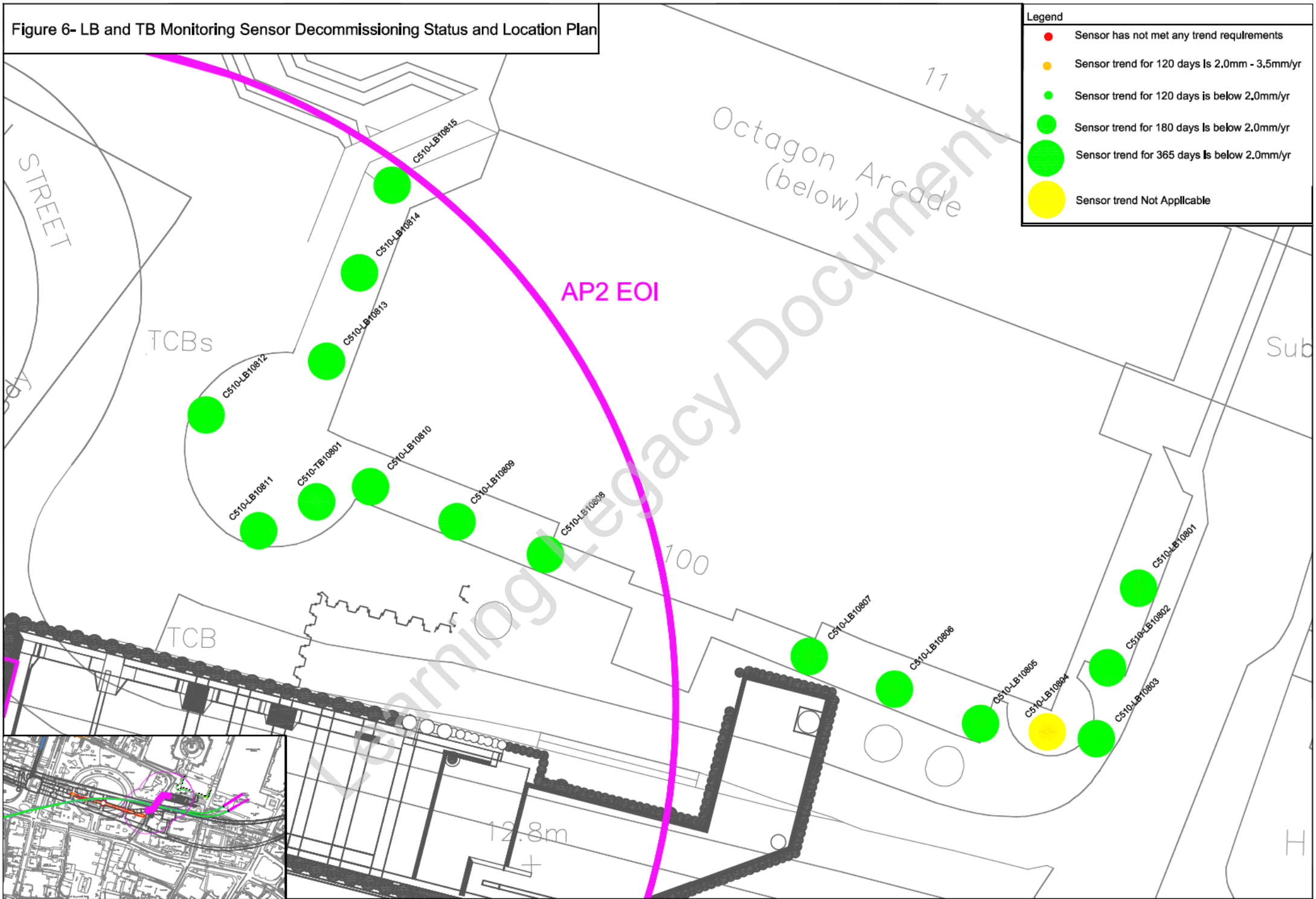
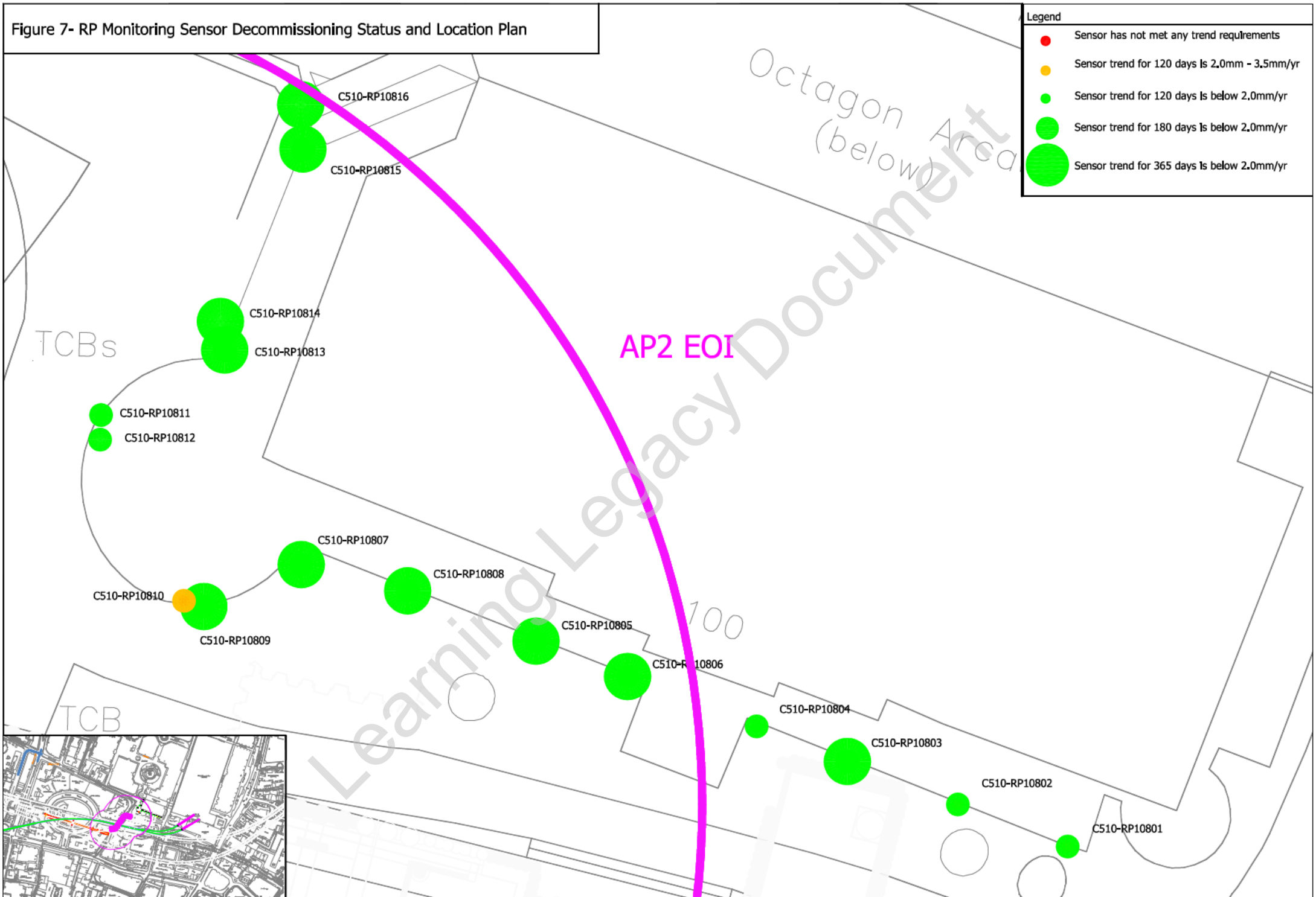




Figure 7- RP Monitoring Sensor Decommissioning Status and Location Plan



## 6 Decommissioning Recommendations

Through the monitoring assessment process in Section 5, it is purposed that all Block 08 sensors are to be decommissioned. *Table 2* Decommissioning Tracker lists all Block 08 monitoring sensor's decommissioning status and the supporting evidence.

**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