Work Area: SMM	
Work Type: I&M	
Originator Company: GEOCISA	

C435
Farringdon Main Station

CRL Lead reviewer: [redacted]	
CRL Reviewer: [redacted]	

Monitoring Close-Out Report:
Automated Total Station ATS3 and 3D Targets read by ATS3.

CRL Document Number: C435-BFK-C2-RGN-M123-51630

Supplier Document Number: N/A

Contract MDL reference C14.022

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2a. Stakeholder Review Required? YES ☐ NO ☒

Stakeholder submission required: LU ☐ NR ☐ DLR ☐ RfL ☐ LO ☐ Other: _____

Purpose of submission: For no objection ☐ For information ☐

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
					☐
					☐
					☐

compliance with their contractual obligations and does not constitute
ds or materials developed or selected by the designer/supplier.

3. Acceptance by *Crossrail*:

[redacted]eer
09/03/2016

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A. INTRODUCTION

In line with the C122 – M&W Specification KX10 – Instrumentation & Monitoring C122-OVE-Z4-RSP-CR001-00007, this Close-Out Report aims to address the following points in relation to the instrumentation defined in Section 2.

Identify movements observed by the relevant instruments;

Relate these movements to construction activities, where applicable;

Identify trigger breaches that may have occurred;

Demonstrate that the rate of change of the data is either in line with the required rate or such that residual risks are minimal;

Identify any such residual risks should there be considered to be any.

Based on the above points, this close out reports will provide justification for the decommissioning of the instruments.

B. INSTRUMENTS

B.1 Description of the Instruments

This Close-Out Report relates the prisms read by ATS, most of the installed on St John St, Cowcross St and Charterhouse St. See table 1 bellow with the details for the prisms.

Sensor	Location	Northing	Estaing	Elevation
C435-RP00303	WEST MARKET NORTH ELEVATION	82098.5835	36468.3773	125.9535
C435-RP00304	WEST MARKET NORTH ELEVATION	82110.3806	36474.3927	125.9707
C435-RP00305	WEST MARKET NORTH ELEVATION	82122.0475	36480.3402	125.9866
C435-RP00306	WEST MARKET NORTH ELEVATION	82133.8146	36486.2918	125.9615
C435-RP00307	WEST MARKET NORTH ELEVATION	82145.5583	36492.1987	125.9693
C435-RP00308	WEST MARKET NORTH ELEVATION	82156.6692	36497.8212	125.9877
C435-RP00309	2-6 ST JOHN ST	82163.5315	36526.7467	124.3739
C435-RP00310	2-6 ST JOHN ST	82163.7293	36526.8045	130.9564
C435-RP00311	2-6 ST JOHN ST	82168.38	36528.5465	124.069
C435-RP00312	2-6 ST JOHN ST	82168.2253	36528.472	130.6208
C435-RP00313	2-6 ST JOHN ST	82173.0173	36530.2559	123.6855
C435-RP00314	2-6 ST JOHN ST	82172.9944	36530.248	130.9667
C435-RP00315	91-93 CHARTERHOUSE ST	82174.3184	36530.9066	135.7242
C435-RP00316	91-93 CHARTERHOUSE ST	82184.7624	36535.2454	119.9156
C435-RP00317	91-93 CHARTERHOUSE ST	82184.8781	36535.2676	135.2507
C435-RP00318	91-93 CHARTERHOUSE ST	82194.637	36539.4583	119.9447
C435-RP00319	91-93 CHARTERHOUSE ST	82194.6557	36539.454	135.3707
C435-RP00320	91-93 CHARTERHOUSE ST	82205.192	36544.1159	119.9398
C435-RP00321	91-93 CHARTERHOUSE ST	82204.8655	36543.9521	135.5657
C435-RP00322	91-93 CHARTERHOUSE ST	82136.1786	36537.9165	119.3887
C435-RP00323	1 ST JOHN ST	82132.3521	36537.0177	119.3697

C435-RP00325	1 ST JOHN ST	82128.7856	36541.7833	119.3165
C435-RP00327	1 ST JOHN ST	82157.1703	36546.2691	122.7181
C435-RP00328	2-6 ST JOHN ST	82128.6977	36541.9407	119.4936
C435-RP00329	1 COWCROSS ST	82128.2758	36542.6419	127.7621
C435-RP00330	1 COWCROSS ST	82122.3157	36552.3752	119.2093
C435-RP00331	2-3 COWCROSS ST	82126.7738	36545.2839	127.8362
C435-RP00332	1 COWCROSS ST	82121.8007	36552.7486	119.4481
C435-RP00334	2-6 ST JOHN ST	82157.7758	36537.7782	122.4184
C435-RP00335	3-5 ST JOHN ST	82137.1768	36538.0736	120.6223
C435-RP00336	2-6 ST JOHN ST	82158.2931	36530.8387	122.3964
C435-RP00337	3-5 ST JOHN ST	82141.1275	36538.5727	120.7009
C435-RP00338	2-3 COWCROSS ST	82122.2237	36552.6596	124.969
C435-RP00339	3-5 ST JOHN ST	82144.7215	36539.036	120.5735
C435-RP00340	2-6 ST JOHN ST	82157.7158	36538.1573	129.6306
C435-RP00341	2-6 ST JOHN ST	82158.23	36531.2104	129.631
C435-RP00342	4-5 COWCROSS ST	82122.2227	36552.6605	124.9695
C435-RP00343	2-6 ST JOHN ST	82157.1405	36546.2323	130.2794
C435-RP00344	1 ST JOHN ST	82136.2884	36537.9935	129.9571
C435-RP00345	1 ST JOHN ST	82131.615	36536.968	129.9846
C435-RP00346	1 ST JOHN ST	82128.9409	36541.5306	129.9926
C435-RP00347	3-5 ST JOHN ST	82137.4506	36538.086	128.2955
C435-RP00348	3-5 ST JOHN ST	82140.9608	36538.51	128.2938
C435-RP00349	3-5 ST JOHN ST	82129.246	36542.1123	130.1666
C435-RP00350	1 ST JOHN ST	82131.6483	36543.5896	130.1757
C435-RP00351	1 ST JOHN ST	82135.2044	36542.1465	130.5703

Table 1: Details of the prisms read byATS03.

The prisms reading by ATS03 installed on 87 Charterhouse St are shown in the following documents:

Drawings:

- C435-BFK-C2-RGN-M123-50059-IR-RP-ATS03

Installation Reports:

- C435-BFK-C2-RGN-M123-50029
- C435-BFK-C2-RGN-M123-50008

B.2 Location of the Instruments

The buildings where the prisms are installed are located along St John St, Charterhouse St and Cowcross St. The prisms are installed on the façade for the building. In some case there are prisms in the same vertical but, different levels.

Figure 1 – Map showing the Location for the prisms read by ATS3

C. MOVIMENTS

C.1 Movements Resulting from Construction Activities

C.1.1 Relevant Crossrail (BFK) Works

The construction activities associated with these instruments are related to Crossrail tunneling works. In all cases, these comprise of the passage of a TBM (C300), platform tunnel enlargement and cross passengers tunnel. Also some areas for the prisms read by ATS03 were been affected by different compensation grouting episode from Moorgate Shaft1 and Shaft2

The prisms reading by the ATS03 are installed on buildings on St John St, Cowcross St and Charterhouse St. In some case the prisms are installed in different levels. The disposition for the façade on Cowcross St and St John St are the best one to analyze the movements. The prisms installed on Charterhouse St are parallel to the main tunnels. Prisms from ATS03 on Charterhouse St were affected by WB TBM, EB TBM, PTW, PTE CP4 and CH2.

Activity	Start Date	End Date
WB TBM	27/09/2013	04/10/2013
EB TBM	15/01/2014	20/01/2014
PTW	21/06/2014	18/09/2014
PTE	06/08/2014	27/10/2014
CP4	17/09/2014	29/09/2014
CH2	17/05/2014	28/05/2014

C.1.2 Resulting Movements

To analyse the result for the prisms will be separate by buildings:

- 1 Cowcross St.
- 2-3 Cowcross St
- 4-5 Cowcross St.
- 1 St John St.
- 2-6 St John St.
- 3-5 St John St
- 91-93 Charterhouse St.
- West Market North Elevation

- <u>1 Cowcross St</u>

The monitoring data for this building is showing in Appendix B.

The movements captured by the prisms installed on this building, show he different works that has been carried out closer to the building.

Before TBM affected to this building some grouting episode was carried out from Moorgate Shaft 1. The first episode was carried out on August 2013. This grouting caused 5mm maximum. After these episodes the movement captured by the prisms show a settlement trend. During this trending the prisms show 4mm settlement. When the building was inside the influence area for EB TBM, the prisms captured 4-5mm of settlement. After he TBM, the trend for the building was continued during 5-6 months, adding another 4mm of settlement, until a new grouting episode was carried out. For this episode on July 2014, 2-3 mm of heave was captured.

After this episode, the building was inside of the influence area for PTE enlargement. During this construction works, the maximum settlement captured by the prisms was 6mm maximum.

At the end of the PTE construction works, a grouting episode was carried out, causing 2mm of heave. After this episode, the building was inside for the influence area for CP4 construction. During the CP4, another 6 mm of settlement was captured by the prisms. At the end of the CP4, the prisms continue settling, adding 10mm in 15months.

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

- 2-3 Cowcross St

The movement captured by the prisms installed on this building is showing in Appendix B.

The behaviour of the prisms installed, is very similar to the 1 Cowcross St, because both buildings were affected for the same works.

Before TBM arrive to the area were the prisms are installed, some grouting episode was carried out to improve the ground conditions. The prisms captured in total, 2-3mm of heave. After these episodes, the prisms show very stable conditions.

During the TBM, the prisms show 4-5mm of settlement. After the TBM, the building continues settling during 7 months.

When the building was inside the influence area for PTE, the prisms show the maximum settlement. In total, during this period, the maximum settlement was -10mm.

During the CP4 construction, another 4-5mm was captured by the prisms.

After finish all works closer to this building, a trend of settlement was captured by the prisms, adding 8mm more, until December 2015. From this date, and according with the instruction C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

At the end, and with the combination for all works, the maximum movement on this building (settlement) was -28mm.

- 4-5 Cowcross St

The result for the data for the prisms installed on this building is showing in the Appendix B.

Before TBM arrived, some grouting episode was carried out to improve the ground conditions. The maximum movement caused by the grouting was 2-3mm of heave. After this episode, all prisms show stable conditions until the TBM cross the building. During the TBM, the prisms show around 4-5mm of settlement. After TBM, the prisms captured a trend of settlement, adding 2mm more, until PTE.

Between TBM and PTE, no grouting was carried out on this area..

When the building was inside the PTE influence area, the prisms show 8mm of settlement. At the end of the PTE construction, grouting episode was carried out to try to stop the settlement trend, caused 1-2mm of heave.

After PTE, the building was affected by CP4 construction. During these works another 4-6mm was captured by the prisms installed on the building. After the CP4, the trend of the movements was continued, but the trend was less. The total settlement for the building captured by the prisms was -26mm.

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

- 1 St John St.

The data for the prisms installed on this building is showing in Appendix B.

As the graphic shows, some grouting episode was carried out before the TBM in order to improve the settlement. During these first episodes, 6mm was captured by the prisms. After these episodes, the prisms show a settlement trend before the TBM. During this trend, 3-4mm was disappearing.

During the TBM on January 2014, 2-3mm of settlement was captured by the prisms. In this case, all the prisms show the same movement. After the TBM, the building continues settling

during 6 months, adding another 4mm, until September, when a new grouting episode was carried out. During this episode, the prisms show maximum 1-2mm of heave.

After these episodes, the building was affected by the PTE enlargement works. During this period, the prisms captured 8-10mm of settlement. After finish the PTE, the building was inside the influence area for the CP4 construction. During these works, the prisms show 2-3mm maximum of settlement. At the end of the construction phase, the maximum settlement captured by the prisms on this building was -20mm.

At the end of the CP4, the building continue settling, adding 10-12mm during 15 months

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015

- 2-6 St John St

The result, for the prisms installed on 2-6 St John St is presented in Appendix B.

This building is located on the junction between St John St and Charterhouse St. For this reason, the behaviour for the prisms is different. The prisms installed on the Charterhouse St façade are parallel to the tunnels, and the prisms installed on St John façade are perpendicular to the axis of the tunnel.

Before the TBM, some grouting episode was carried out to improve the ground conditions. These episodes, caused in total 6-7mm of heave in all prisms installed on this building. After these episodes, all prisms show stable conditions, until WB TBM arrived. When the building was inside the influence area for the TBM, 3mm of settlement was captured by the prisms installed on Charterhouse St façade, while the prisms on St John didn't show movements. After the TBM, a trend on the movements was observed in all prisms, adding another 4-5mm more on settlement.

During the EB TBM, the behaviour is the opposite than WB TBM. During this period, the prisms on St John façade show 2-3mm of settlement, while the Charterhouse St once didn't show movements. The prisms on the building show the jumps for the construction activities at different time, but the rate for the movements are similar.

After both TBM's the prisms show a trend on the settlement, adding 4mm more.

Before PTW enlargement works, some grouting episode was carried out to improve the ground conditions and try to stop the trend. During the episodes, 2-3mm of heave was captured by the prisms. After this compensation, the building was affected by the PTW, causing 8-9mm of settlement maximum.

At the same time, the building was affected by PTW (on the east) and by PTE (on the west)

During PTE enlargement, 6mm of settlement was captured by the prisms. After finish this work, the prisms continue show settlement until 13-12-2015. Currently the maximum settlement on this building was -32mm

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

- 3-5 St John St

The result, for the prisms installed on 3-5 St John St is presented in Appendix B.

The behaviour for this group of prisms is similar than the prisms installed on 2-6 St John St., because the location for the building is similar. In this case, the location for the building is in the junction between St John St and Cowcross St.

Before the TBM, the grouting episode was carried out to improve the ground conditions, caused around 6-8mm of heave. After this episode, all prisms show a trend on the movements adding 6mm. When the building was inside the influence area for the TBM, 3-4mm of settlement was captured by the prisms. After the TBM, a trend on the movements was observed, adding another 5mm more on settlement. Before the PTE, a new grouting episode was carried out, caused 6mm of heave maximum on the prisms closer to the tunnel.

During PTE enlargement works, the maximum settlement captured by the prisms was 6-8mm. After PTE, a new grouting episode was carried out to improve the ground conditions, caused 2-3mm maximum of heave.

During CP4 works, 5-6mm of settlement maximum was captured by the prisms. After this work, the building continues settling, adding 10mm more in 15 months.

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

- 91-93 Charterhouse St

The result, for the prisms installed on 91-93 Charterhouse St is presented in Appendix B.

The locations for the prisms are parallel to the main tunnels. All of them are installed on Charterhouse St façade.

Before the TBM, the grouting episode was carried out to improve the ground conditions, caused around 6-8mm of heave. After this episode, all prisms show stable conditions. When the building was inside the influence area for the WB TBM, 3-4mm of settlement was captured by the prisms. After the TBM, a trend on the movements was observed, adding another 3-4mm more on settlement. During the EB TBM, the prisms captured 4mm of settlement. After the TBM, the prisms show a trend on the movements, adding 4mm of settlement.

Before the PTW, a new grouting episode were carried out, caused 6mm of heave maximum on the prisms closer to the tunnel. During PTW, 7-8mm of settlement was captured by the prisms.

During PTE enlargement works, the maximum settlement captured by the prisms was 5-6mm. After PTE, the prisms continue show a trend on the movement.

The last important work affected to this building was CH2 tunnel. For this work, another 6mm of settlement was captured by the prisms.

At the end, the total settlement captured by the prisms installed on this building was 38mm.

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

- West Market North elevation

The result, for the prisms installed on the Market is presented in Appendix B.

Before the TBM, a grouting episode was carried out to improve the ground conditions, caused around 2-3mm of heave. After this episode, all prisms show stable conditions.

When the building was inside the influence area for the TBM, 2-3mm of settlement was captured by the prisms installed on the Charterhouse ST façade. After the TBM, a trend on the movements was observed, adding another 2mm more on settlement until December 2013. From this date all prisms show stable conditions.

Before the PTW, a new grouting episode was carried out, caused 2-3mm of heave. During PTW enlargement works, the maximum settlement captured by the prisms was 3-4mm. After PTW the prisms continue settling adding another 3-4mm until a new grouting episode to stop the trend for the movements. From this date (March) the prisms show very stable conditions. At the end, the maximum settlement captured by the prisms was 6mm.

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015

C.2 Trigger Breaches

The Instrumentation and Monitoring Plan: Farringdon Station Ground Movement and Asset Protection C122-OVE-C2-RGN-M123-50013 outlines the triggers associated with the works. Green trigger is less (80%) that the predicted movement.

In this case, all prisms read by ATS3 are inside the compensation Grouting area, so the criteria for the triggers are the slope criteria.

POINT ID	TYPE	DIRECTION	DATE OF LAST READING	LAST READING VALUE (mm)	TRIGGER LEVEL	
					WORST HISTORICAL STATUS	CURRENT STATUS
C435-RP00303	AUTOMATIC RP	Settlement	13/12/2015 12:21	-2	Clear	Clear
C435-RP00304	AUTOMATIC RP	Settlement	13/12/2015 12:21	1.4	Clear	Clear
C435-RP00305	AUTOMATIC RP	Settlement	13/12/2015 12:21	-3.4	Clear	Clear
C435-RP00306	AUTOMATIC RP	Settlement	13/12/2015 12:21	-1.9	Clear	Clear
C435-RP00308	AUTOMATIC RP	Settlement	13/12/2015 12:21	-3.7	Clear	Clear
C435-RP00309	AUTOMATIC RP	Settlement	13/12/2015 12:21	-26.9	Default Alert	Default Alert
C435-RP00310	AUTOMATIC RP	Settlement	13/12/2015 12:21	-27.2	Default Alert	Default Alert
C435-RP00311	AUTOMATIC RP	Settlement	13/12/2015 12:21	-27.8	Default Alert	Default Alert
C435-RP00312	AUTOMATIC RP	Settlement	13/12/2015 12:21	-27.6	Default Alert	Default Alert
C435-RP00313	AUTOMATIC RP	Settlement	13/12/2015 12:21	-29	Default Alert	Default Alert
C435-RP00314	AUTOMATIC RP	Settlement	13/12/2015 12:21	-28.3	Default Alert	Default Alert
C435-RP00316	AUTOMATIC RP	Settlement	13/12/2015 12:21	-30.5	Default Alert	Default Alert
C435-RP00317	AUTOMATIC RP	Settlement	13/12/2015 12:21	-33.1	Default Alert	Default Alert
C435-RP00318	AUTOMATIC RP	Settlement	13/12/2015 12:21	-29.2	Default Alert	Default Alert
C435-RP00319	AUTOMATIC RP	Settlement	13/12/2015 12:21	-29.9	Default Alert	Default Alert
C435-RP00320	AUTOMATIC RP	Settlement	13/12/2015 12:21	-30	Default Alert	Default Alert
C435-RP00321	AUTOMATIC RP	Settlement	13/12/2015 12:21	-31.6	Default Alert	Default Alert
C435-RP00322	AUTOMATIC RP	Settlement	13/12/2015 12:21	-36.5	Default Alert	Default Alert
C435-RP00323	AUTOMATIC RP	Settlement	13/12/2015 12:21	-26.6	Default Alert	Default Alert
C435-RP00325	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.2	Default Alert	Default Alert
C435-RP00327	AUTOMATIC RP	Settlement	13/12/2015 12:21	-26.2	Default Alert	Default Alert
C435-RP00328	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.8	Default Alert	Default Alert
C435-RP00329	AUTOMATIC RP	Settlement	13/12/2015 12:21	-26.4	Default Alert	Default Alert
C435-RP00330	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.4	Default Alert	Default Alert
C435-RP00331	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.8	Default Alert	Default Alert
C435-RP00332	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.6	Default Alert	Default Alert
C435-RP00334	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.3	Default Alert	Default Alert
C435-RP00335	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.8	Default Alert	Default Alert
C435-RP00336	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.7	Default Alert	Default Alert
C435-RP00337	AUTOMATIC RP	Settlement	13/12/2015 12:21	-21.9	Default Alert	Default Alert
C435-RP00338	AUTOMATIC RP	Settlement	13/12/2015 12:21	-23.7	Default Alert	Default Alert
C435-RP00339	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.8	Default Alert	Default Alert
C435-RP00340	AUTOMATIC RP	Settlement	13/12/2015 12:21	-23.9	Default Alert	Default Alert
C435-RP00341	AUTOMATIC RP	Settlement	13/12/2015 12:21	-25.3	Default Alert	Default Alert
C435-RP00342	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.3	Default Alert	Default Alert
C435-RP00343	AUTOMATIC RP	Settlement	13/12/2015 12:21	-23.4	Default Alert	Default Alert
C435-RP00344	AUTOMATIC RP	Settlement	13/12/2015 12:21	-22.9	Default Alert	Default Alert
C435-RP00345	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.5	Default Alert	Default Alert
C435-RP00346	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.3	Default Alert	Default Alert
C435-RP00347	AUTOMATIC RP	Settlement	13/12/2015 12:21	-22.8	Default Alert	Default Alert
C435-RP00348	AUTOMATIC RP	Settlement	13/12/2015 12:21	-21.9	Default Alert	Default Alert
C435-RP00349	AUTOMATIC RP	Settlement	13/12/2015 12:21	-24.2	Default Alert	Default Alert
C435-RP00350	AUTOMATIC RP	Settlement	13/12/2015 12:21	-23.2	Default Alert	Default Alert
C435-RP00351	AUTOMATIC RP	Settlement	13/12/2015 12:21	-21.2	Default Alert	Default Alert

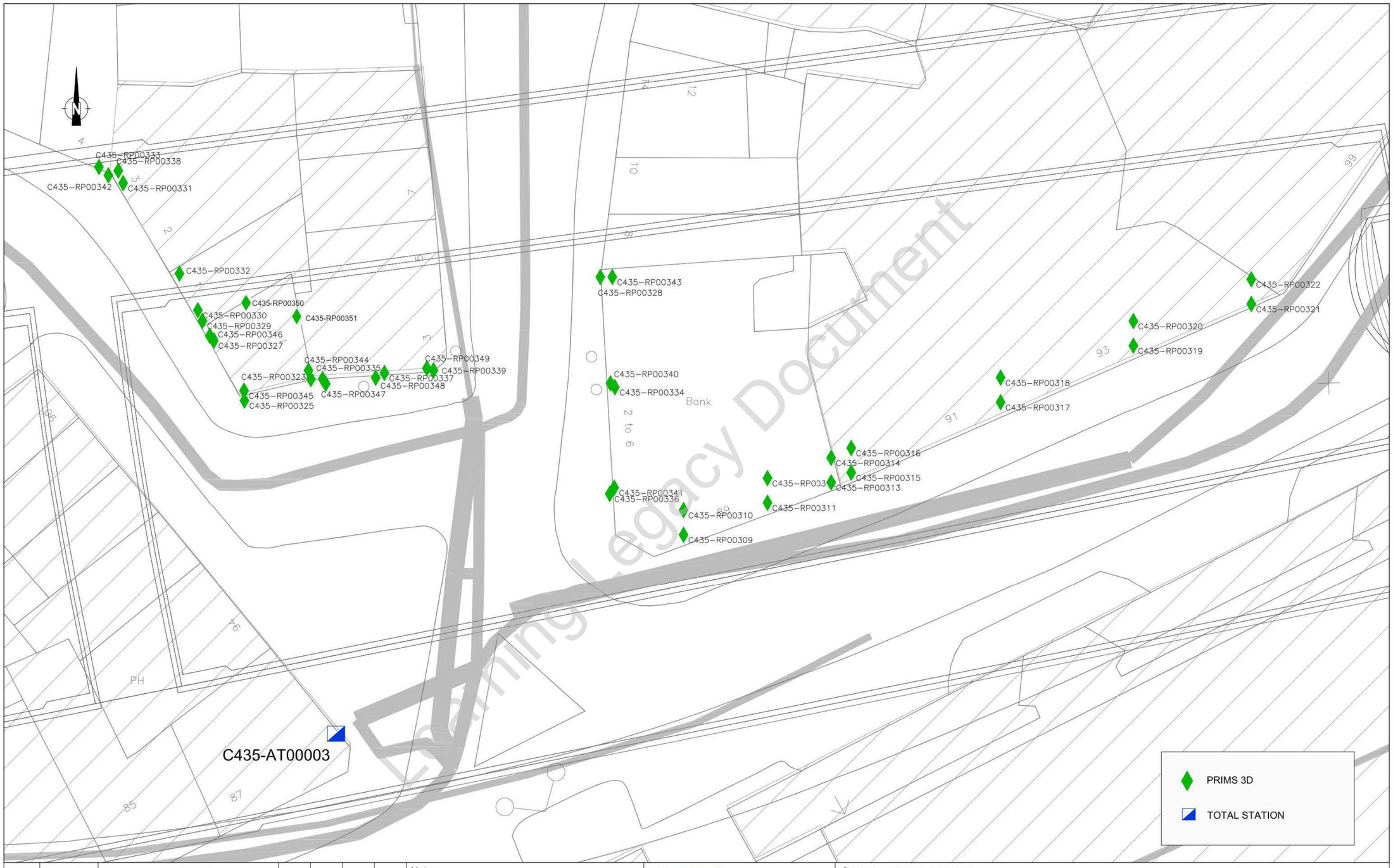
C.3 Significant Issues with the Instrumentation

Due a refurbishment works on 91-93 Charterhouse St, some prisms were covered by a scaffold. Once the scaffold was removed, the prisms covered show the same movement than the other. No offset was need.

C.4 Residual Risks

At the moment, this area monitored by these prisms should be in a Long Term basis with readings every three months, but per C435-PMI-00549 Long Term has being ceased in this area, being the last measure carried out for these devices on 13/12/2015.

APPENDIX A: DRAWINGS



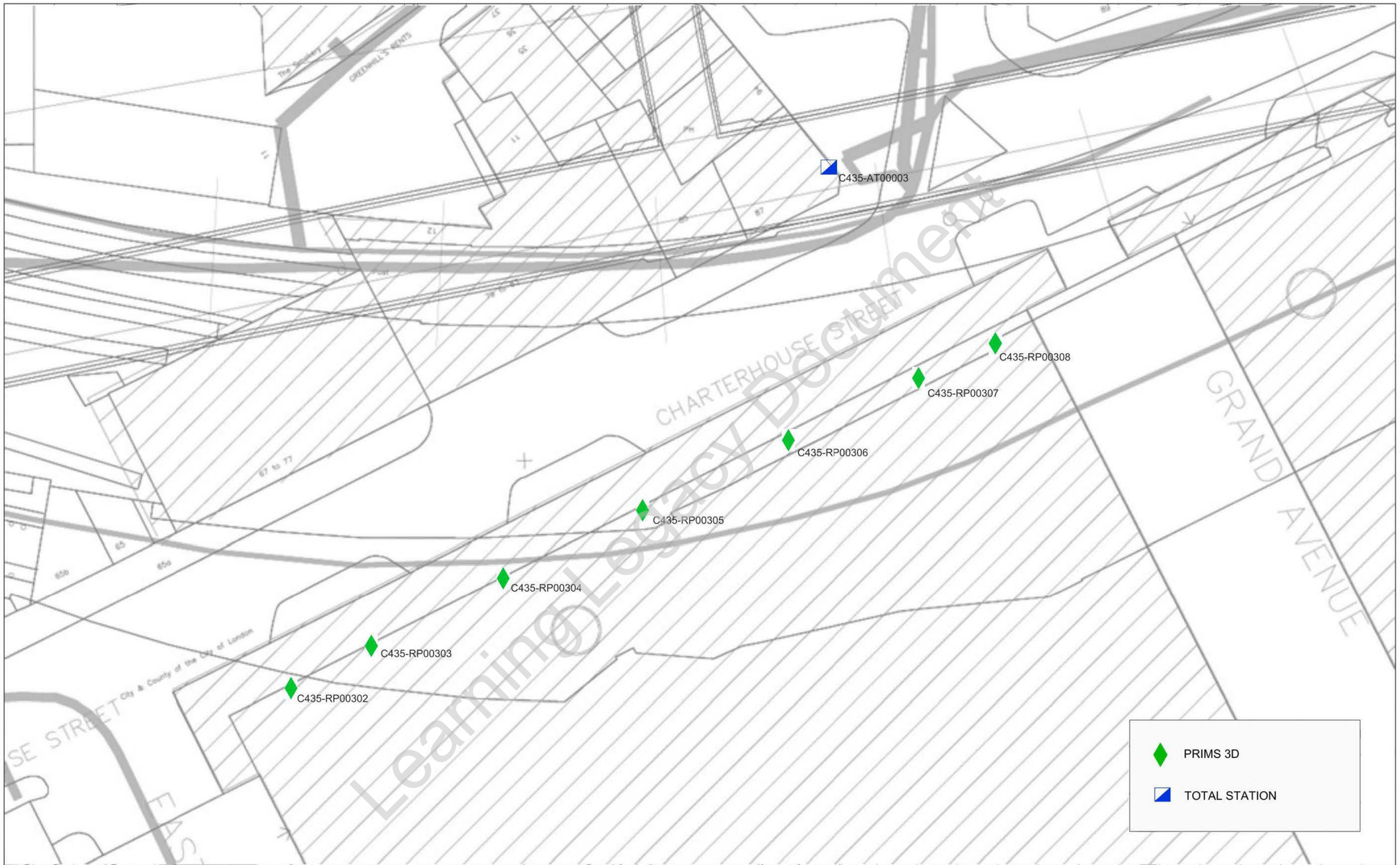
Rev.	Date	Description	By	Chkd	App	Auth
	16-04-2013					

Notes:

GEOCISA UK
C/ Los Llanos de Jerez 10-12
28823- MADRID
www.geocisa.com

Contract : C435 I&M FARRINGDON
Originator : GEOCISA
Location : CROSSRAIL GENERAL
Title : 3D PRIMS ATS3
By : [redacted]
Chk :
App :
Scale : @ A3
Drg No : C435-BFK-C2-RGN-M123-50029-IR-RP-ATS03
Rev :
Suit :
Auth : GEOCISA

Pby



Rev.	Date	Description	By	Chkd	App	Auth
	16-04-2013					

Notes:

Crossrail

BFK Bam | Ferrovial | Kier

GEOCISA UK
C/ Los Llanos de Jerez 10-12
28823- MADRID
www.geocisa.com

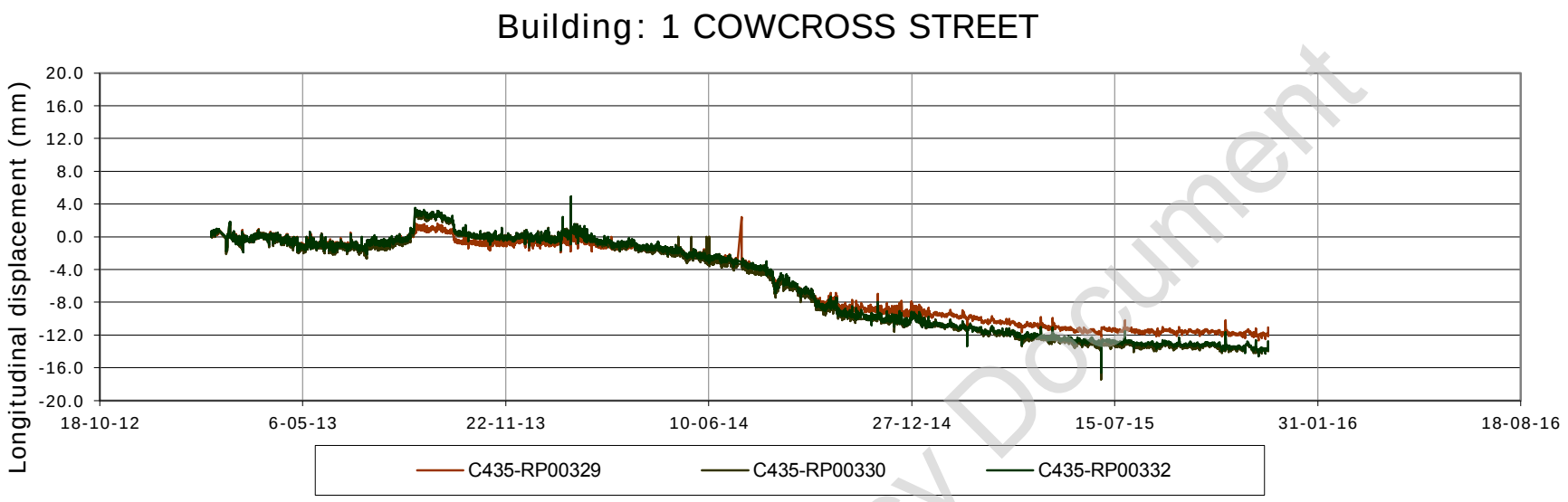
Scale : @ A3

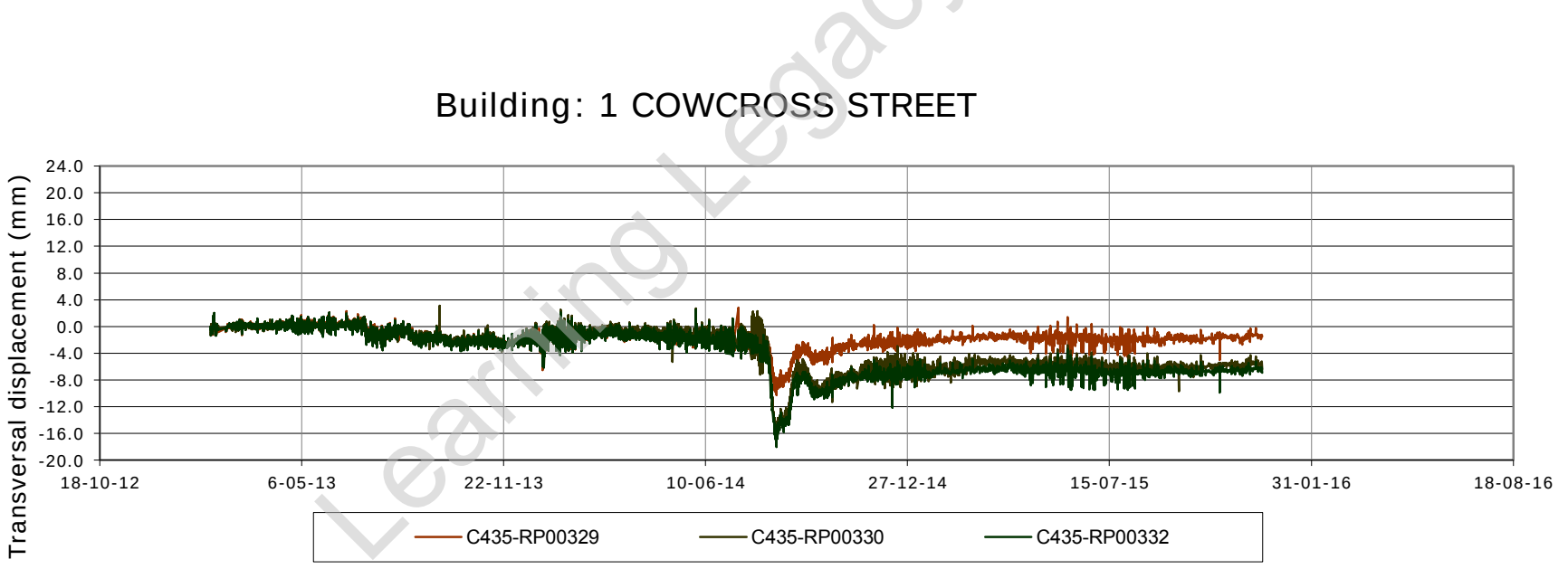
Contract : C435 I&M FARRINGDON
Originator : GEOCISA
Location : CROSSRAIL GENERAL
Title : 3D PRIMS ATS3
By : [redacted]
Chk :
App :
Drg No : C435-BFK-C2-RGN-M123-50029-IR-RP-ATS03
Rev :
Suit :
Auth : GEOCISA

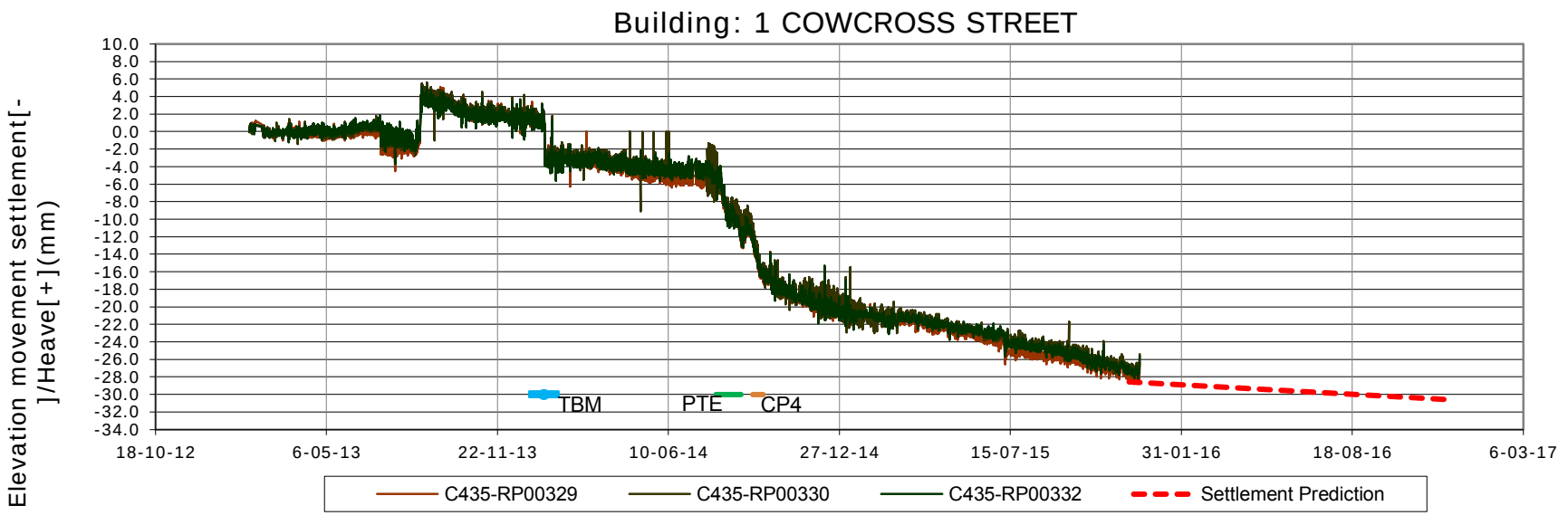
Pby

APPENDIX B: GRAPHS

REPORT	Automatic Prisms
AREA	Farringdon Station
DEVICE	3D Target





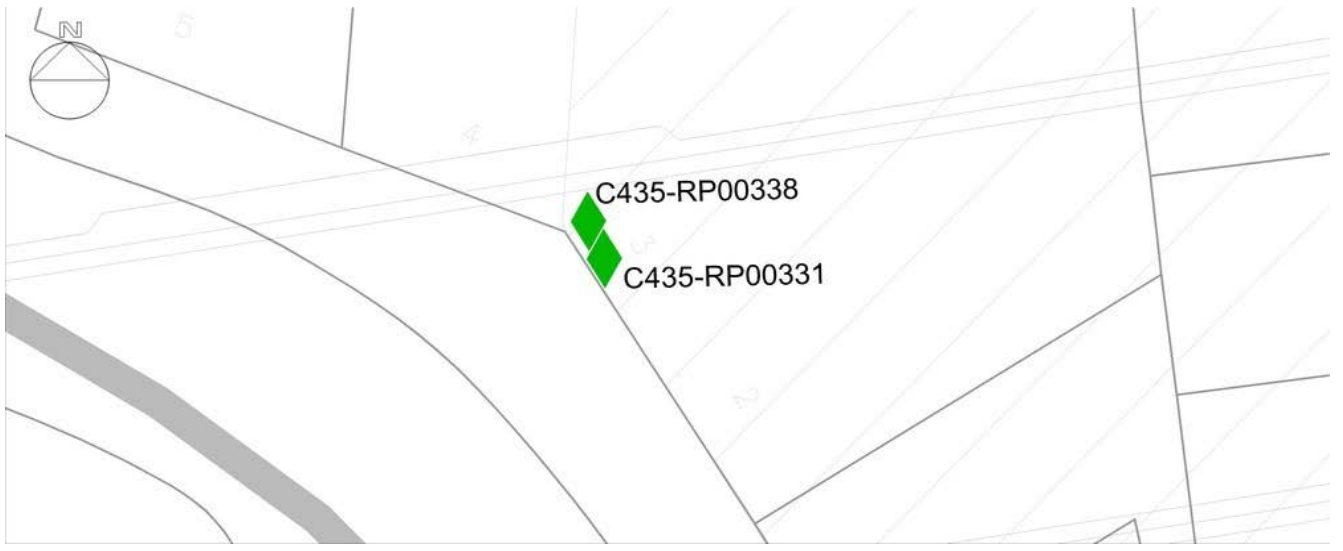


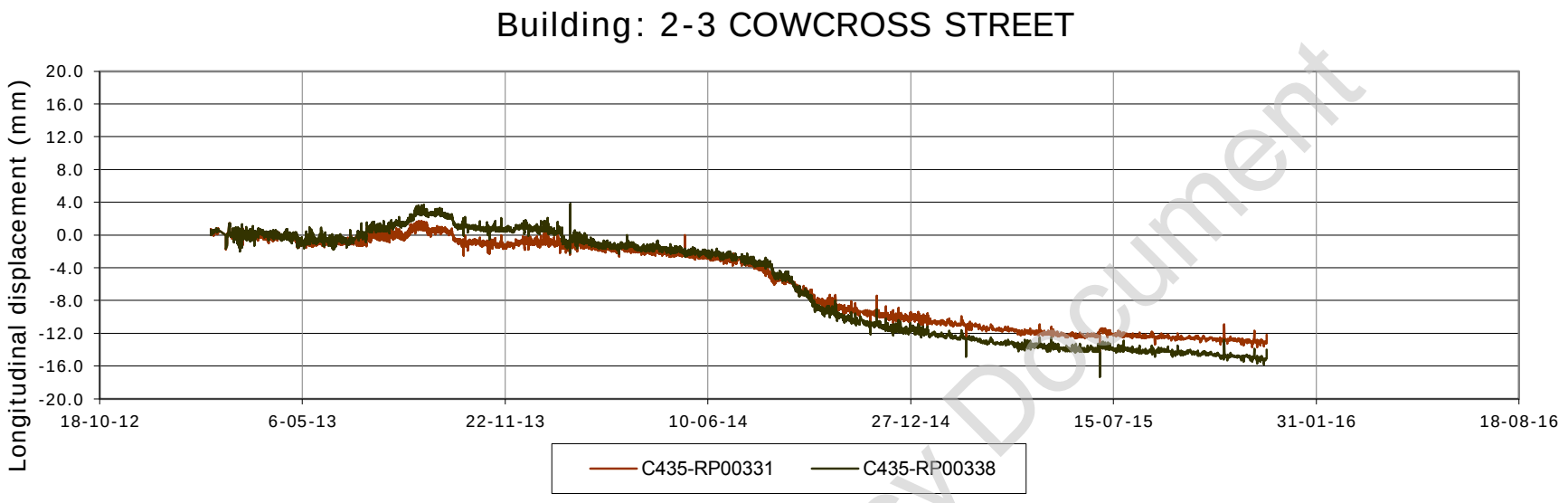
REMARKS:

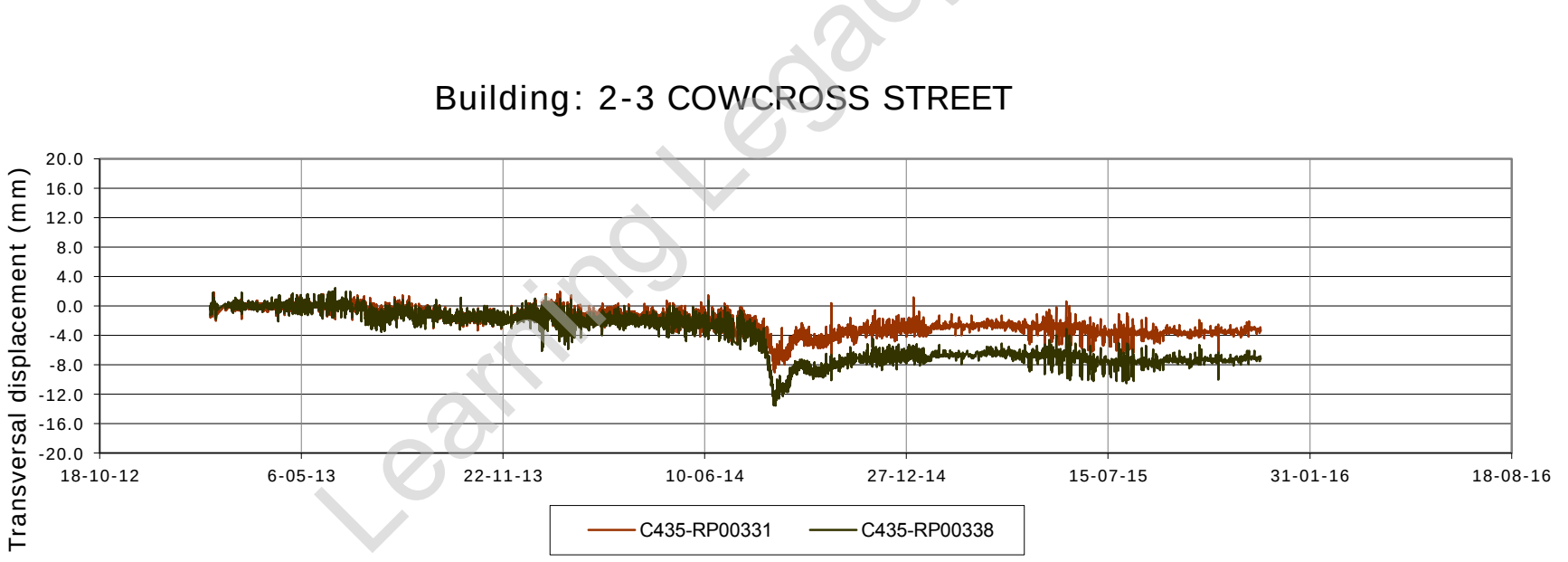
REPORT Automatic Prisms

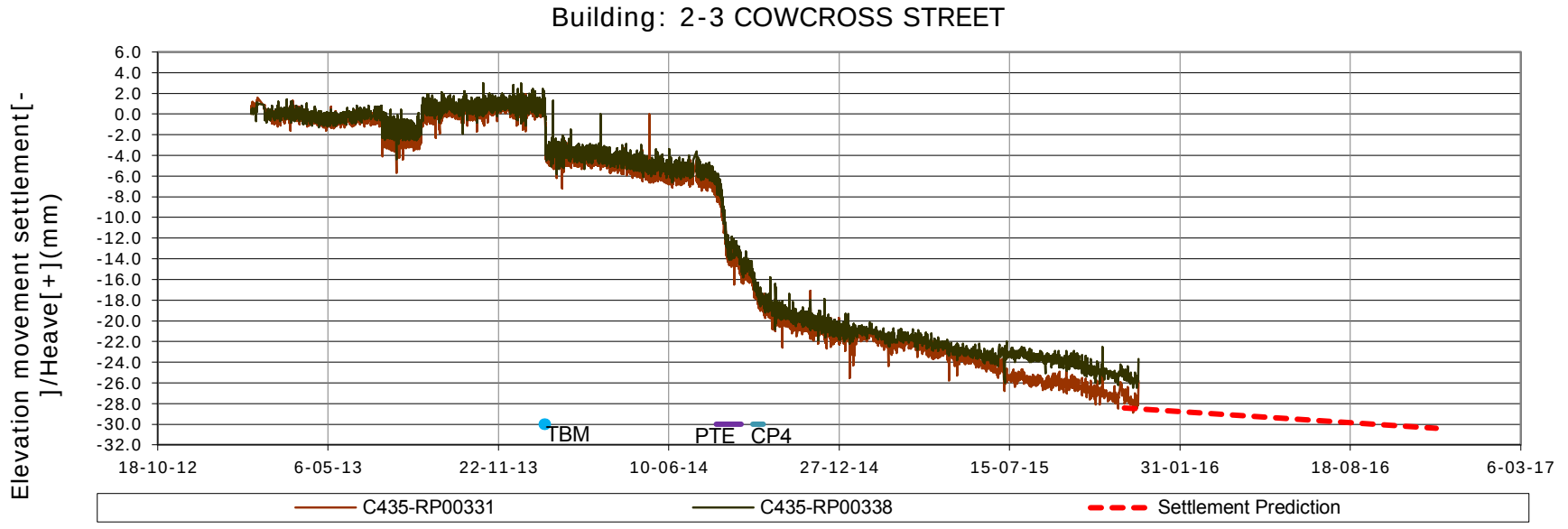
AREA Farringdon Station

DEVICE 3D Target







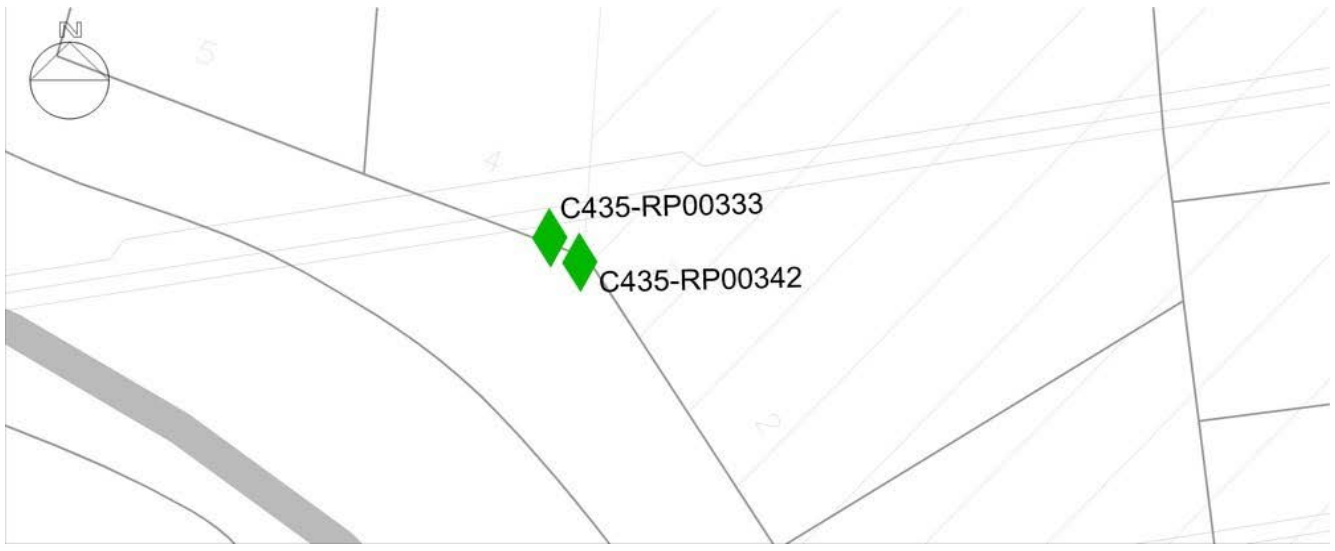


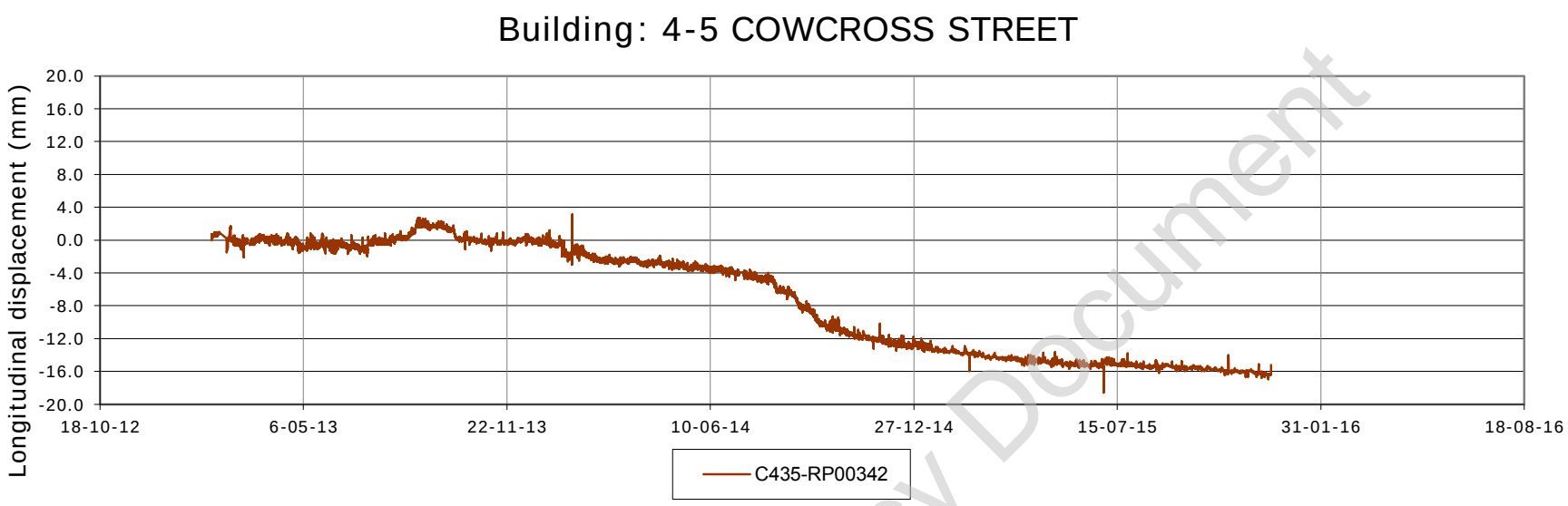
REMARKS:

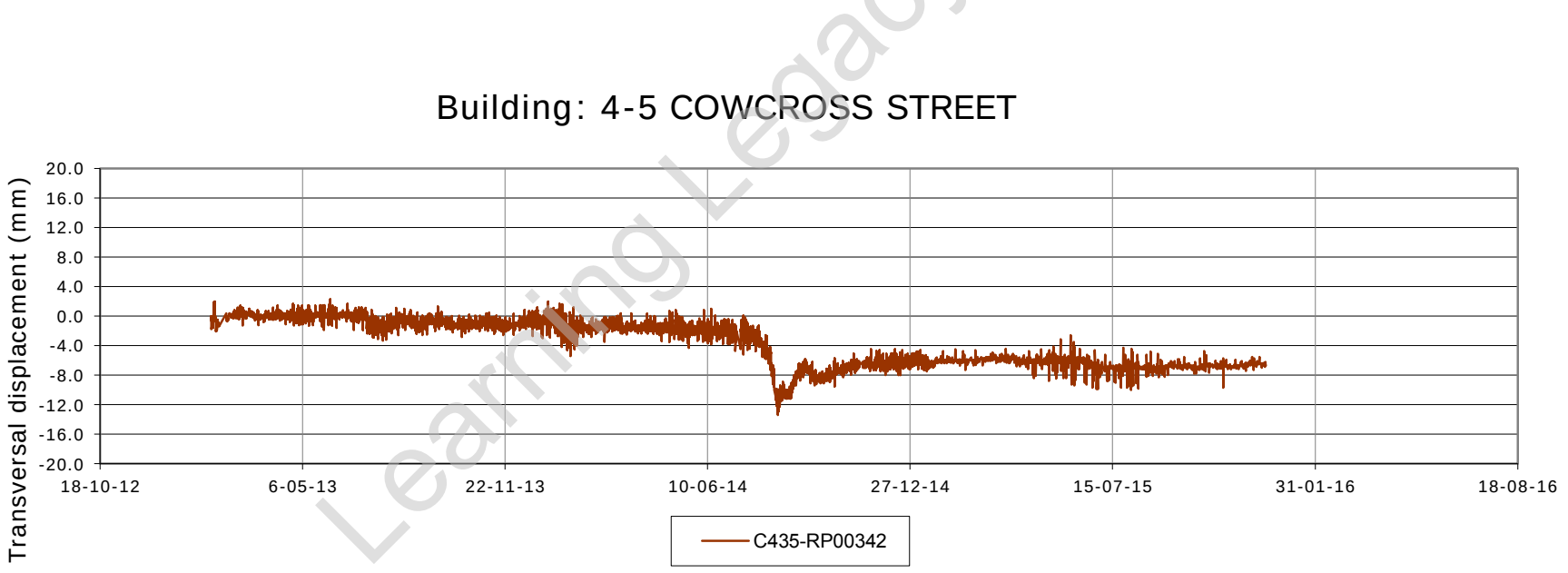
REPORT Automatic Prisms

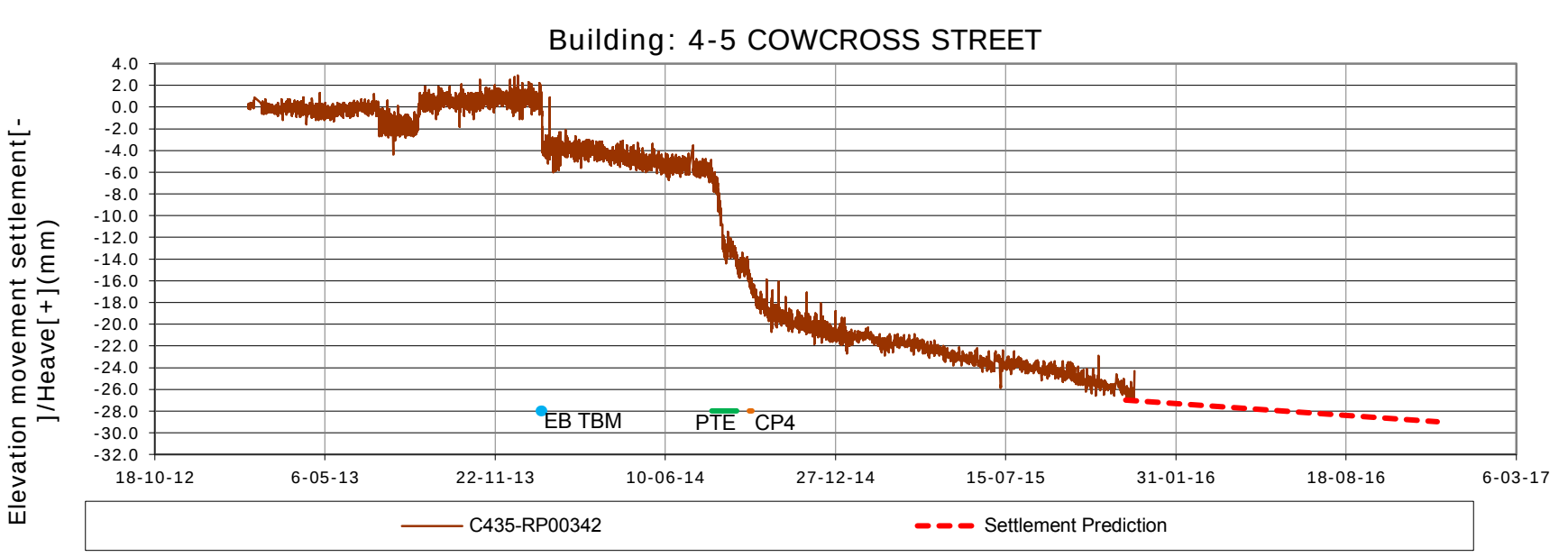
AREA Farringdon Station

DEVICE 3D Target







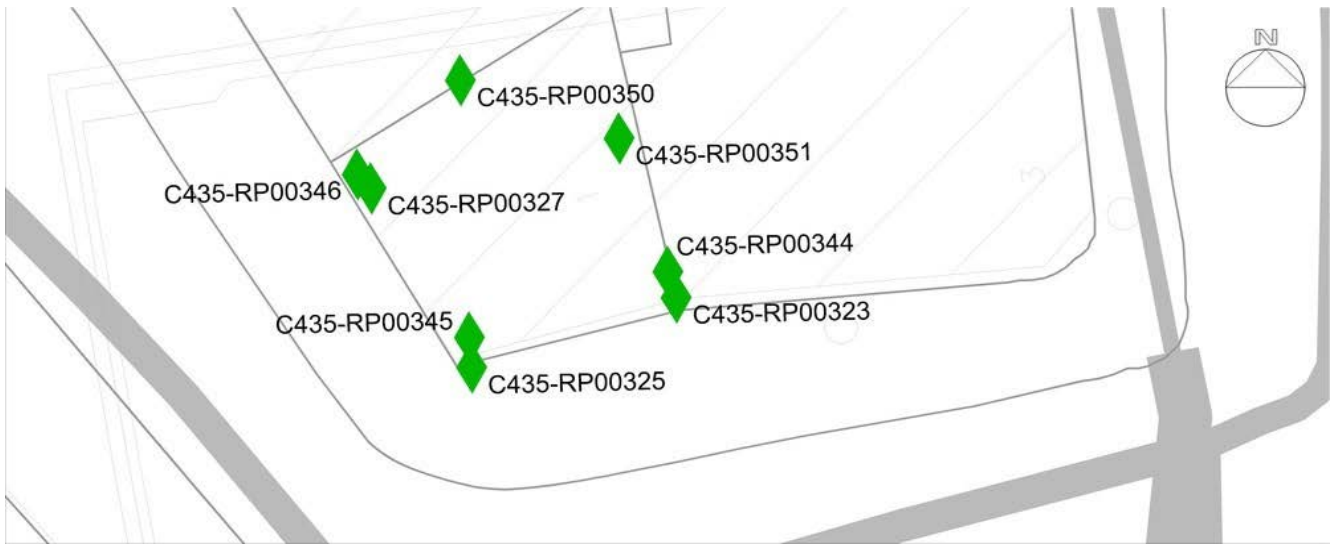


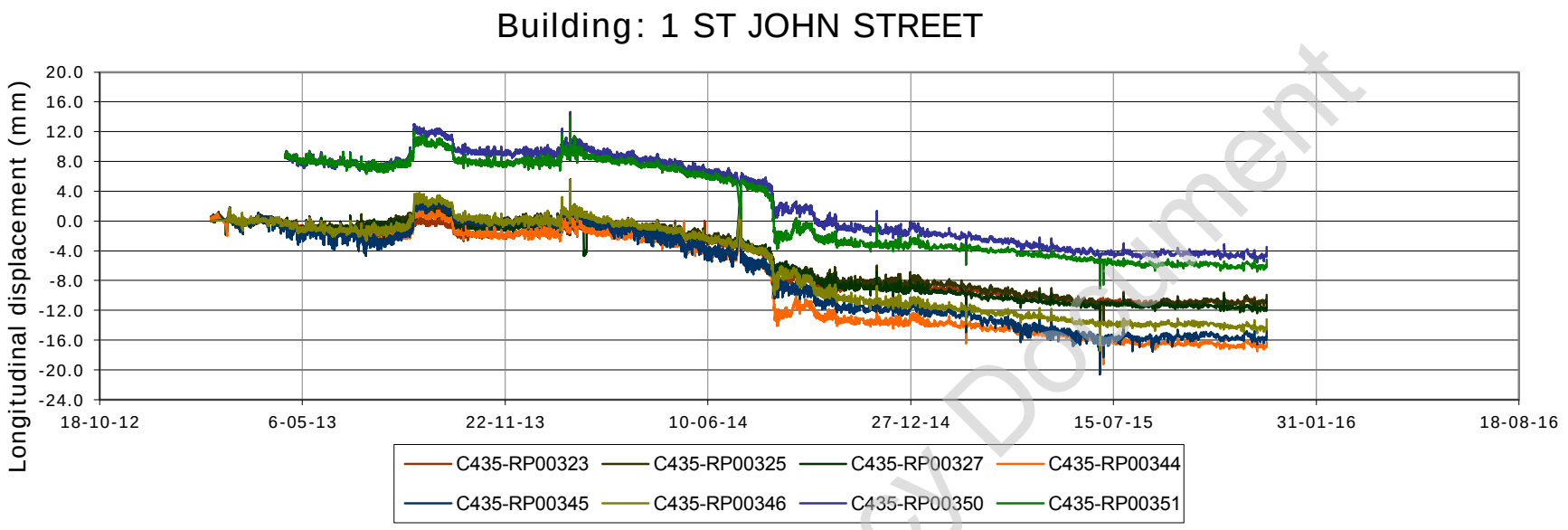
REMARKS:

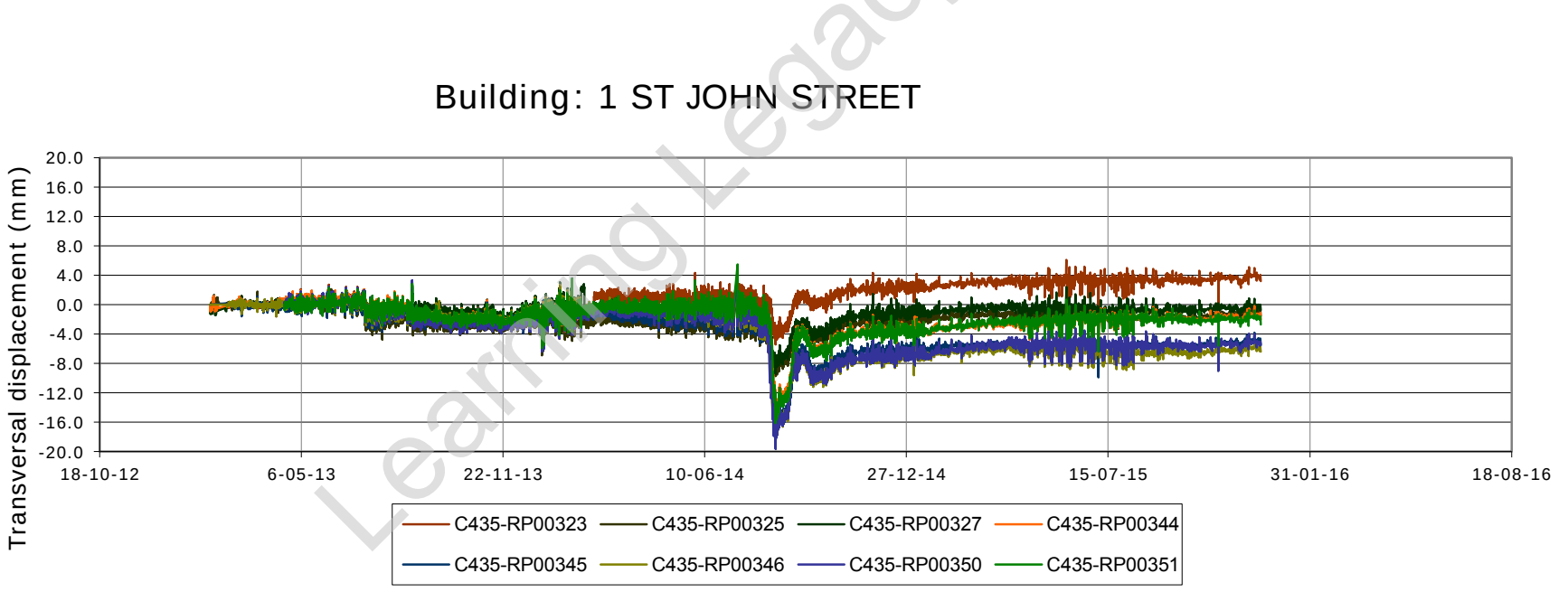
REPORT Automatic Prisms

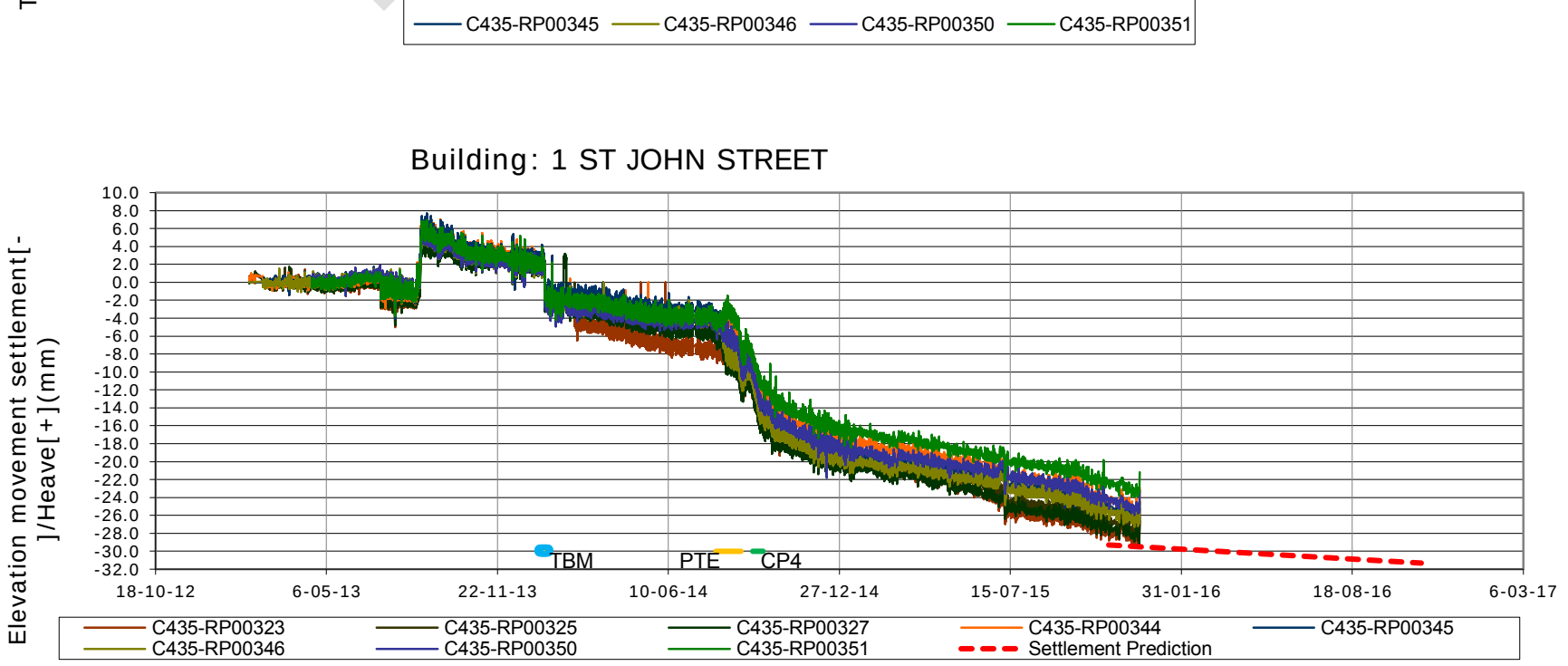
AREA Farringdon Station

DEVICE 3D Target







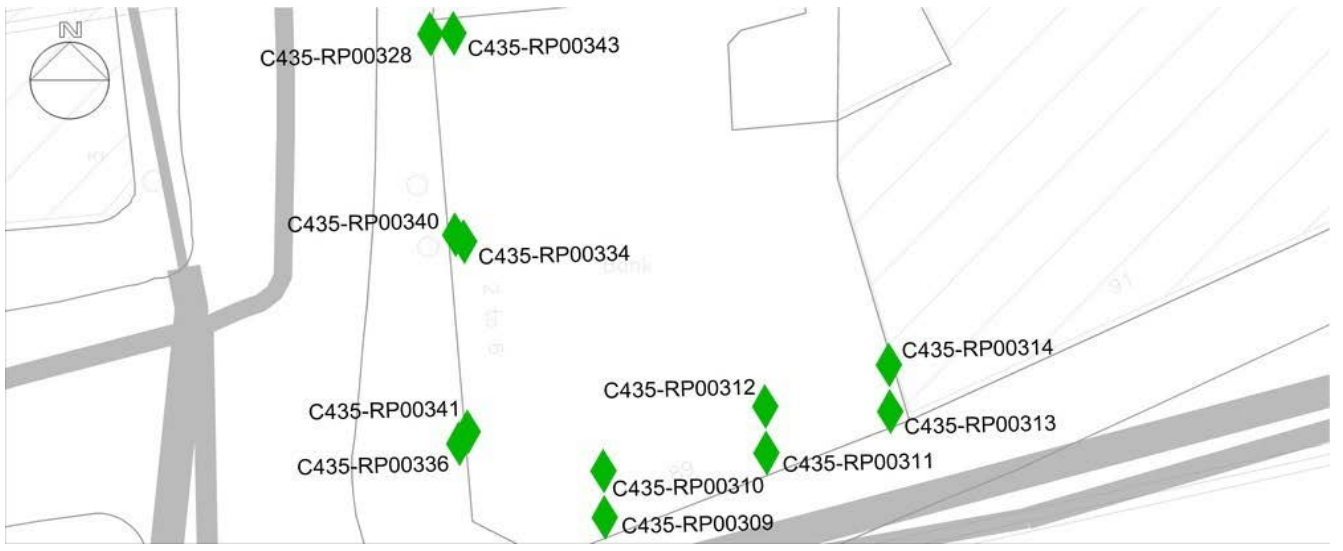


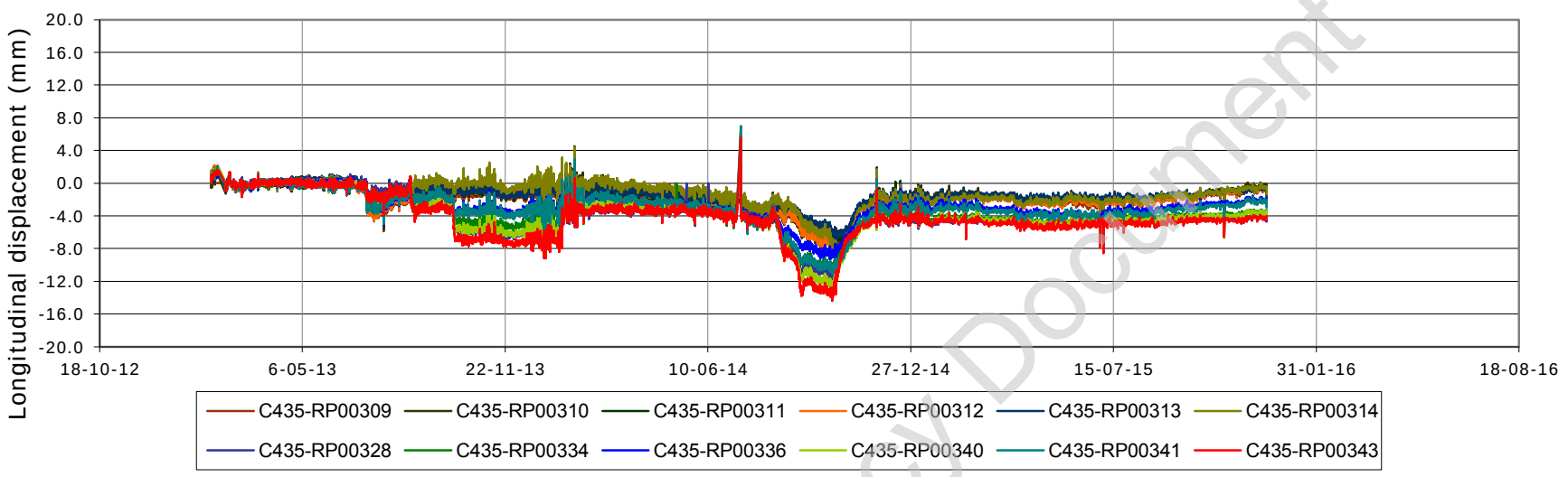
REMARKS:

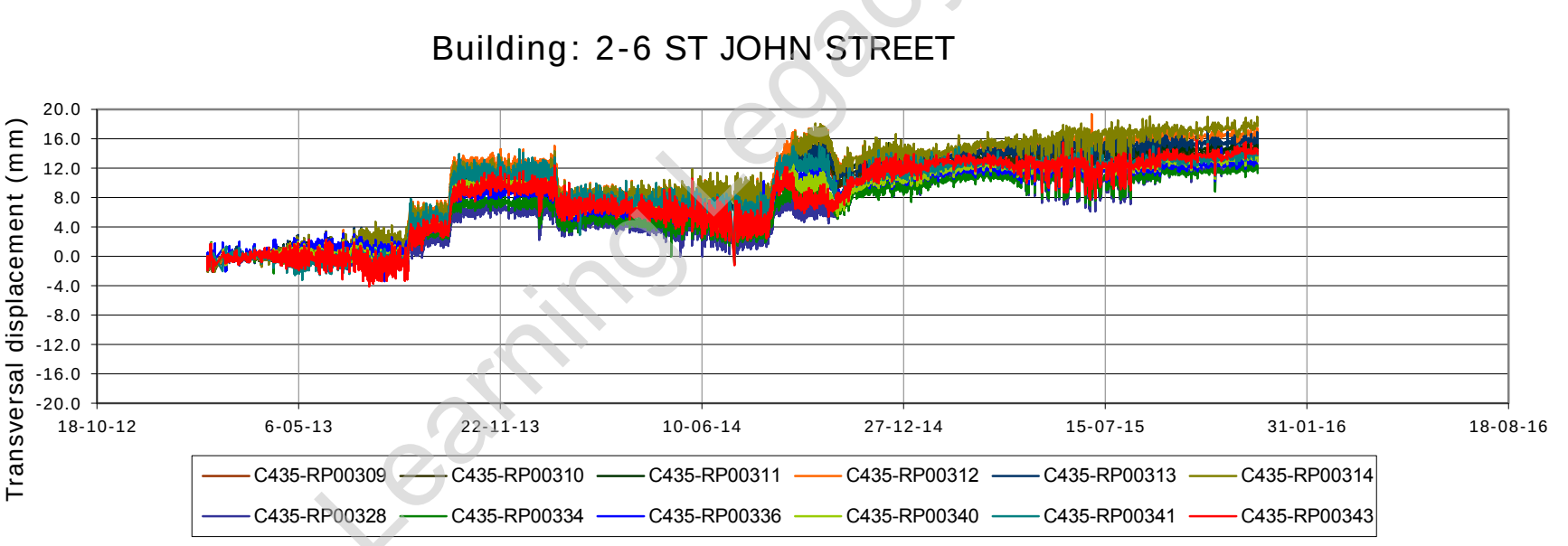
REPORT Automatic Prisms

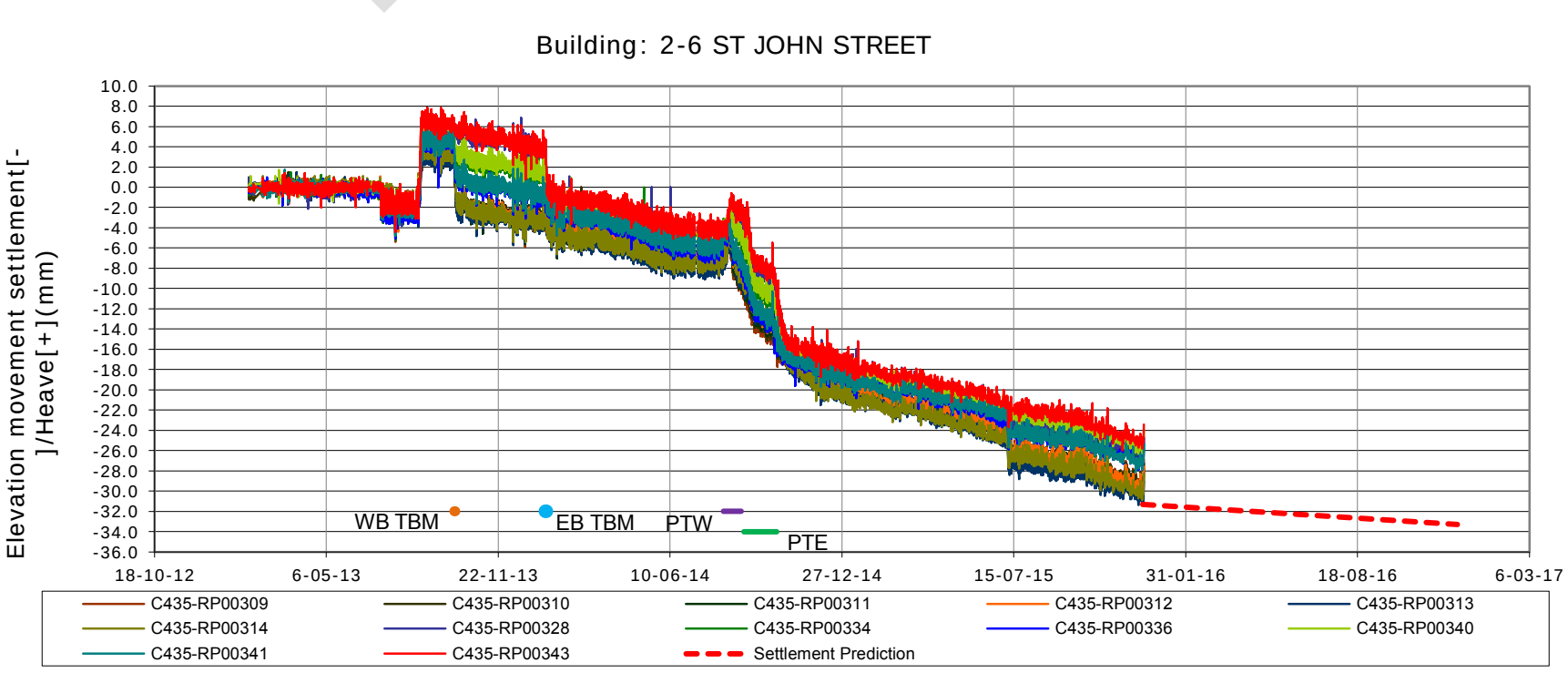
AREA Farringdon Station

DEVICE 3D Target







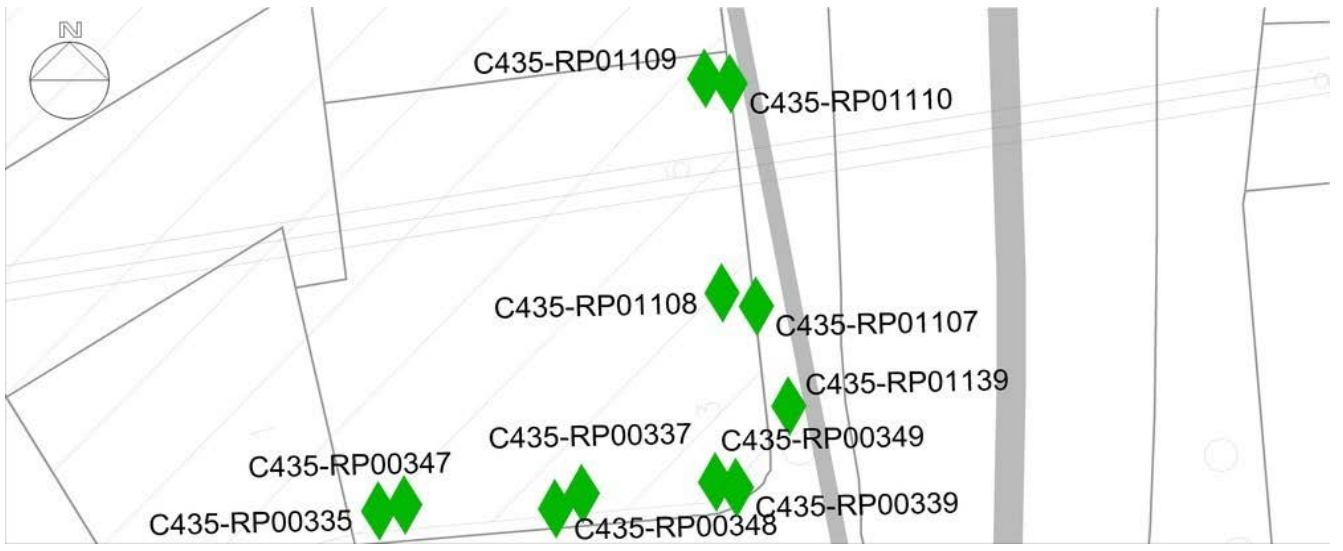


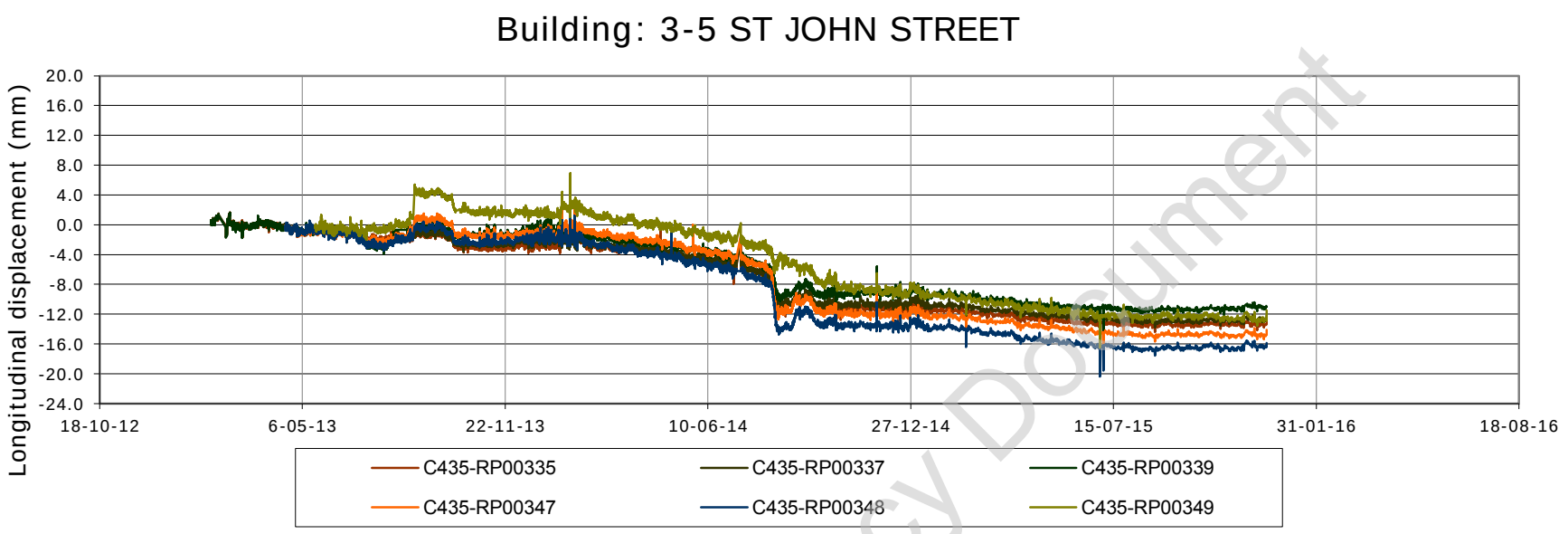
REMARKS:

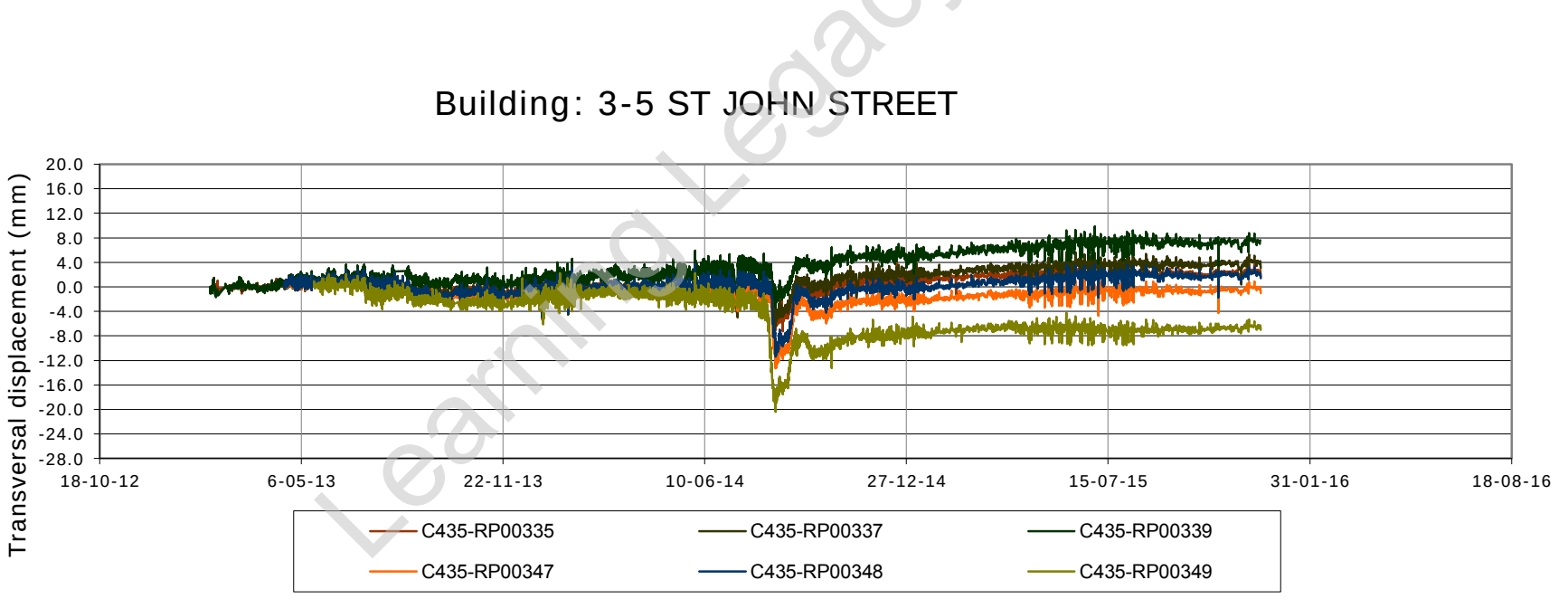
REPORT Automatic Prisms

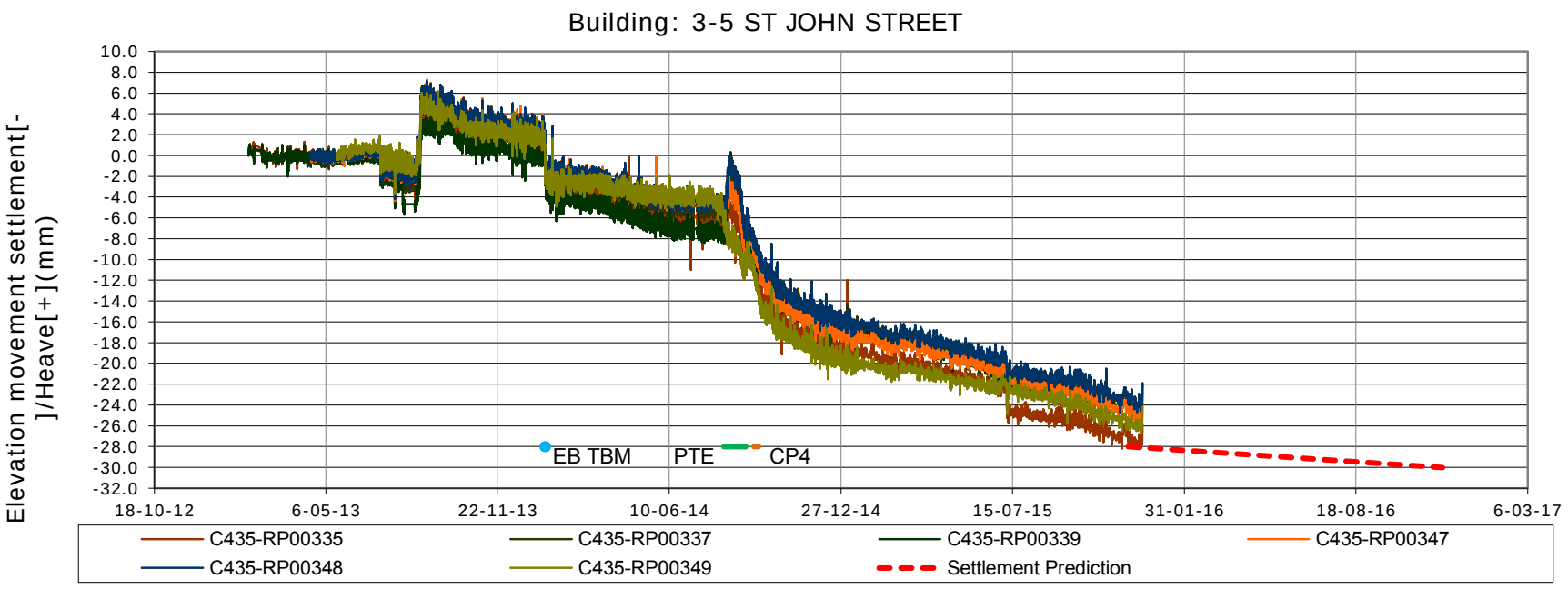
AREA Farringdon Station

DEVICE 3D Target







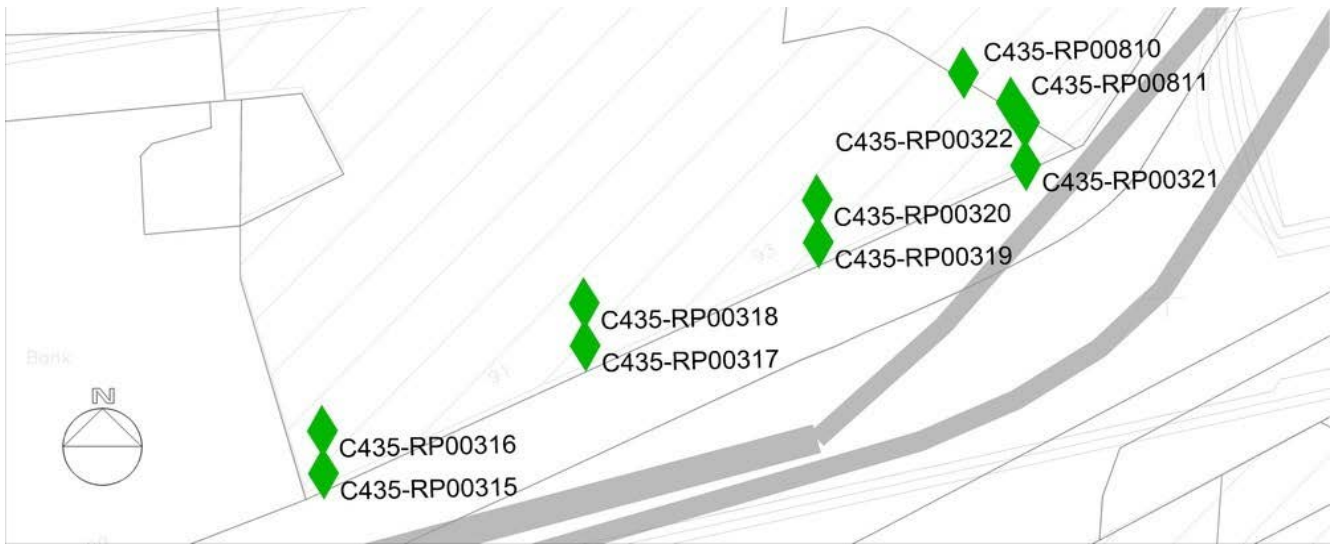


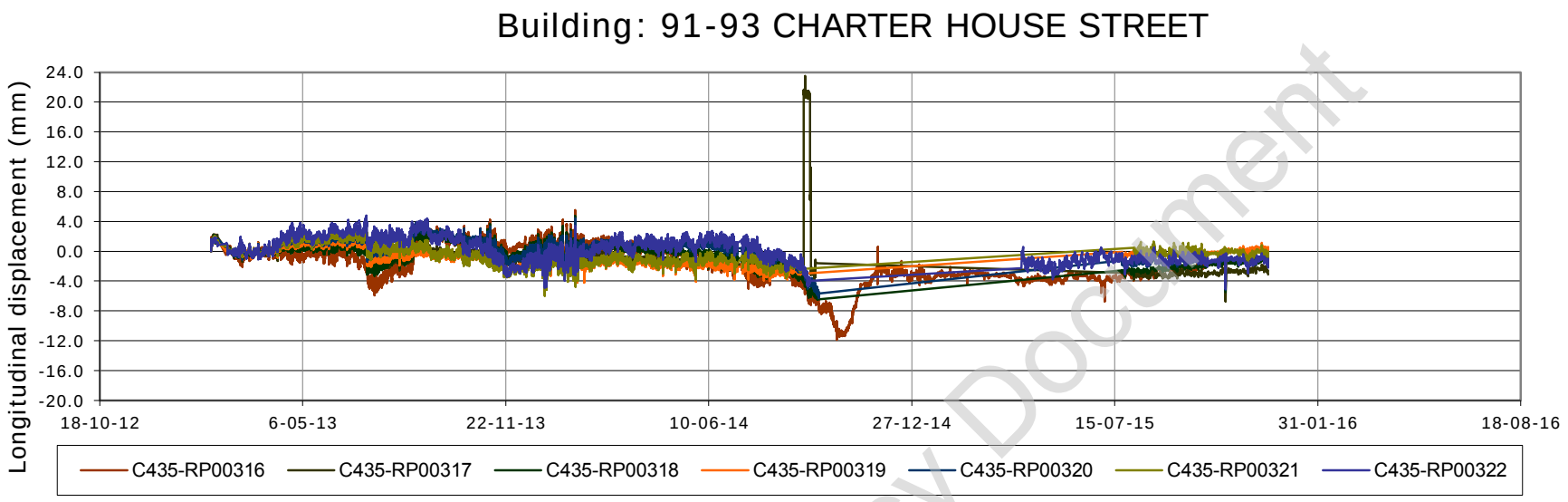
REMARKS:

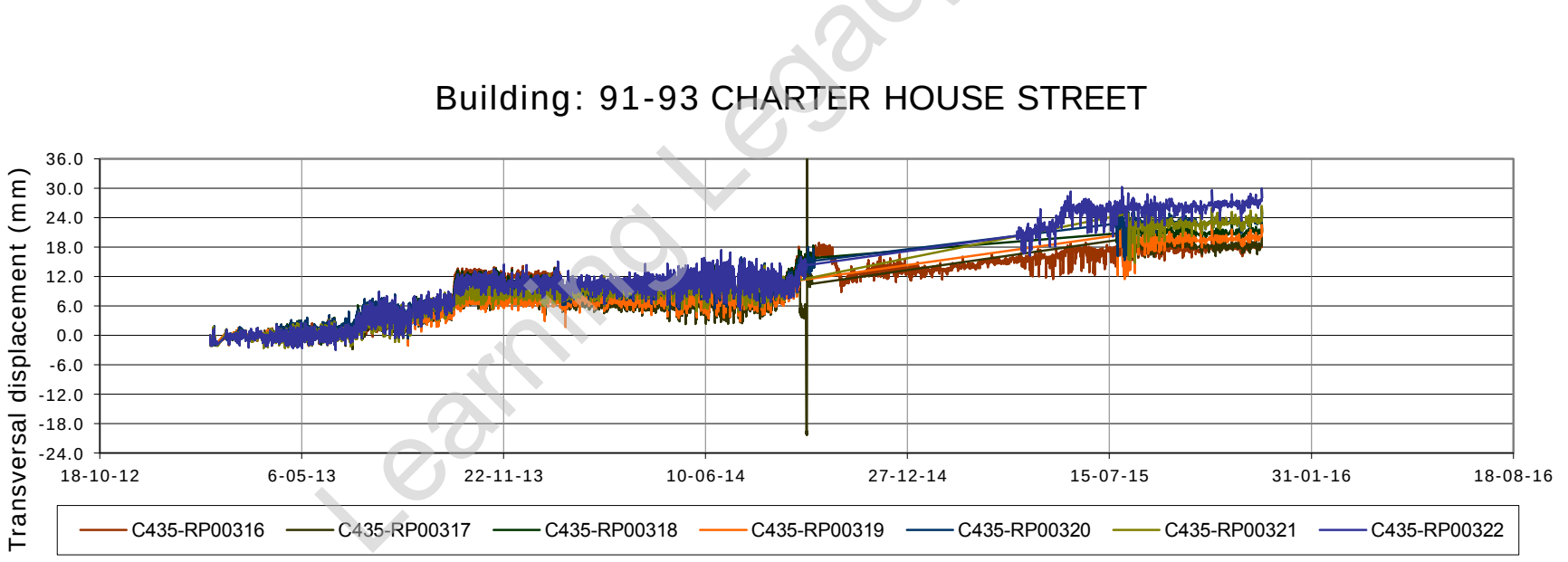
REPORT Automatic Prisms

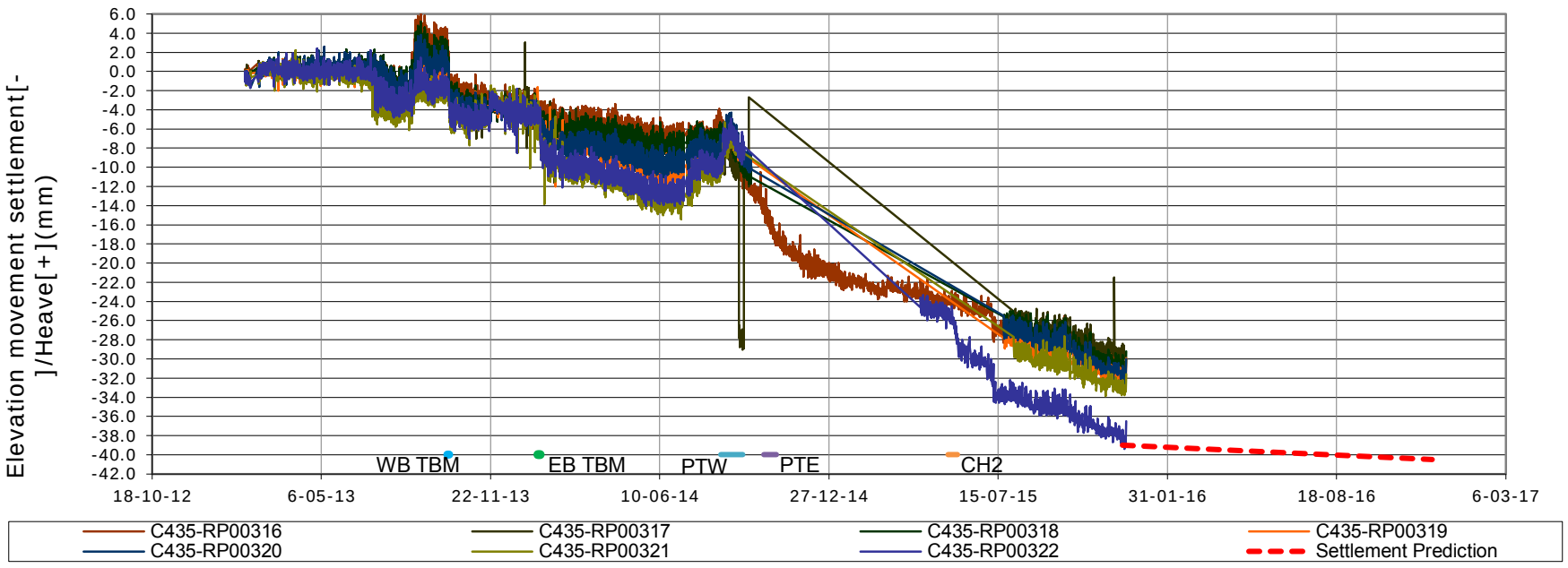
AREA Farringdon Station

DEVICE 3D Target







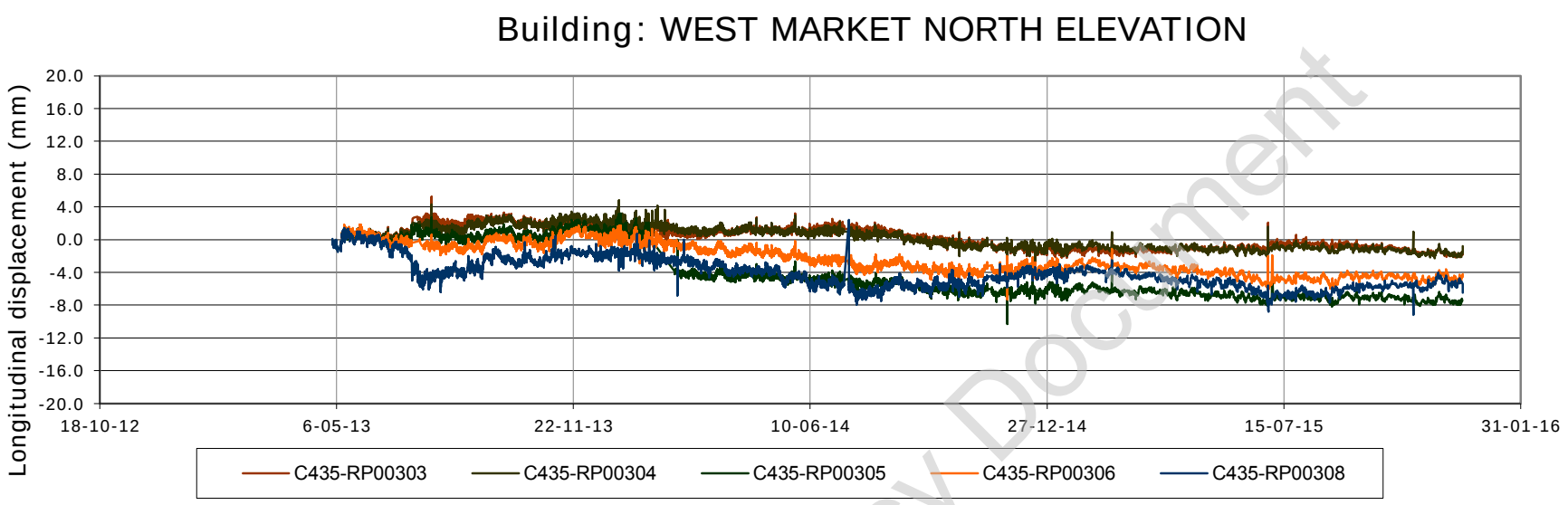


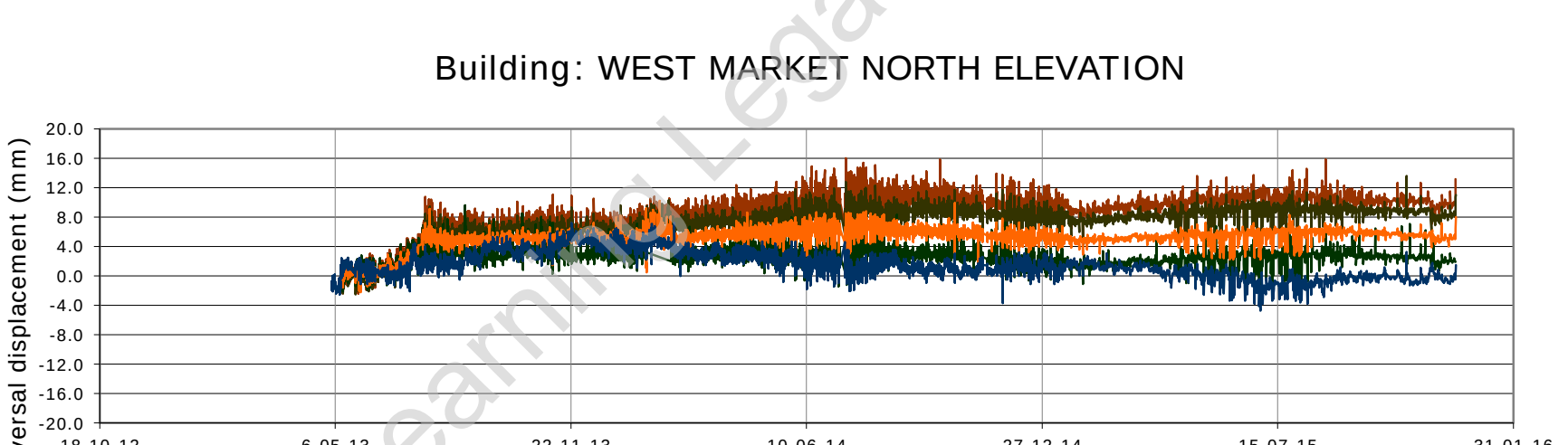
REMARKS:

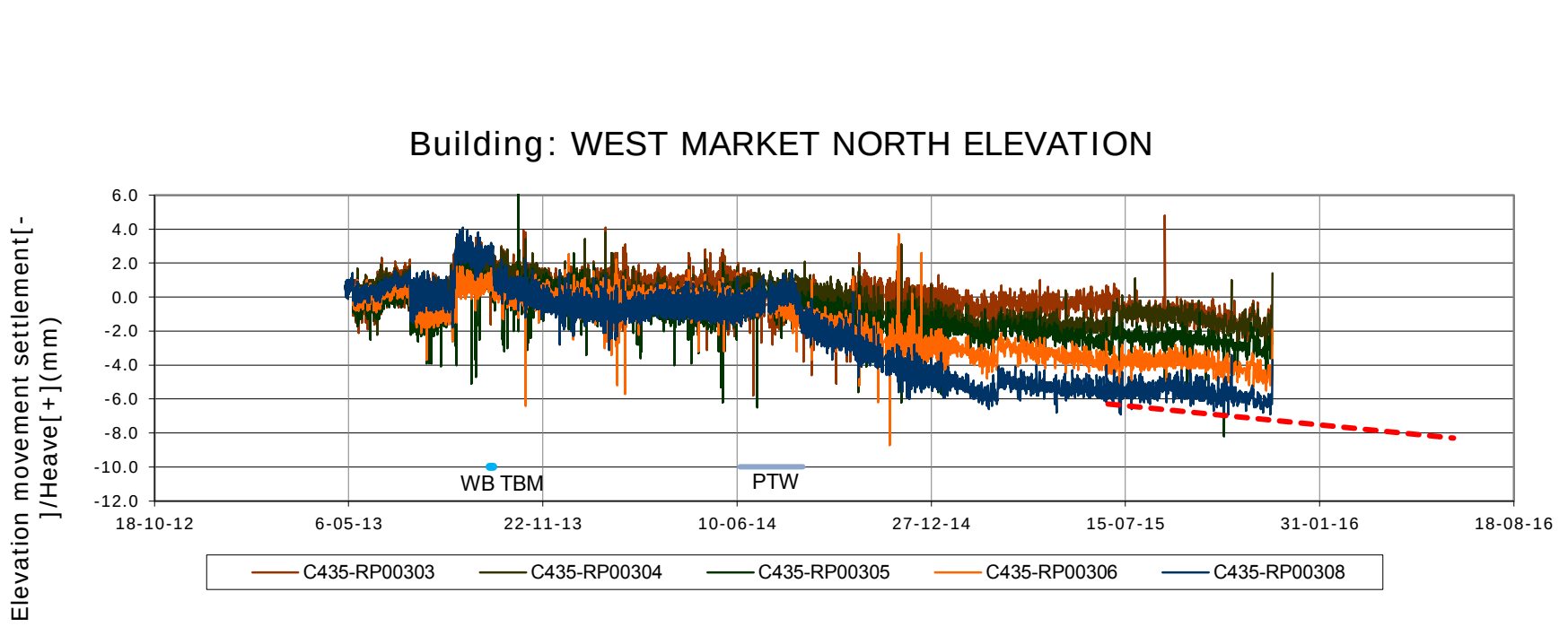
REPORT Automatic Prisms

AREA Farringdon Station

DEVICE 3D Target







REMARKS:

Westbound TBM transit: from 02-10-2013 to 04-10-2013.