



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: In-ground Monitoring Section E

**CRL Document Number: C435-BFK-C2-RGN-M123-51655**  
**Supplier Document Number: N/A**  
**Contract MDL reference C13.012**

### 1. Contractor Document Submittal History:

Revision:	Date:	Prepared by:	Checked by:	Approved by:	Reason for issue:
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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
					<input type="checkbox"/>
					<input type="checkbox"/>
					<input type="checkbox"/>

compliance with their contractual obligations and does not constitute  
it or materials developed or created by the design/supplier.

### 3. Acceptance by Crossrail:

[Redacted]
12/10/2016
[Redacted]

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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 B.

- 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 report will provide justification for the decommissioning of the instruments.

## B. INSTRUMENTS

### B.1 Description of the Instruments

This Close-Out Report relates the In-ground Monitoring Section E, consisting of 1No Extensometer located in Alan Baxter (70-77 Cowcross Street) backyard. See Table 1 below with details.

Instrument	Depths (Below the ground level)	Easting (m)	Northing (m)	Elevation (mATD)	Description
C435-XR10000	5, 8 and 21 (m)	82057.046	36537.312	114.327	Manual extensometer

Table 1: Details of the device installed on Section E.

The extensometer installed on the Section E is shown in the following documents:

#### Drawings:

- C122-OVE-C2-DDA-CR001\_Z-31531. Asses Protection I&M Ground surface and In-ground.
- C435-BFK-C2-DWG-M123-50042. In ground devices installed for Farringdon Station.

#### Installation Reports:

- C435-BFK-C2-RGN-M123-50048. Installation Report- In ground monitoring- Extensometer XR10000.

## B.2 Location of the Instruments

In ground device associated with Section E is located on the plan below highlighted in yellow.

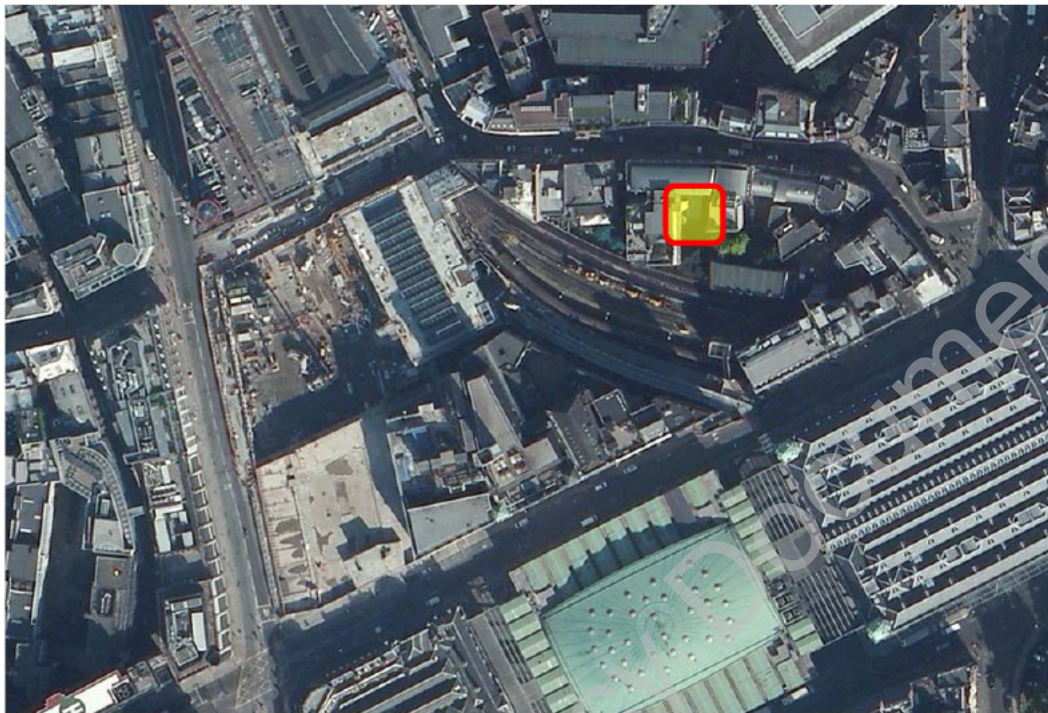


Figure 1 – Plan showing the Location for the device on Section E.

## C. MOVEMENTS

### C.1 Movements Resulting from Construction Activities

#### C.1.1 Relevant Crossrail (BFK) Works

The construction activities affecting this instrument are outlined in the table below.

Activity	Start Date	End Date
EB TBM passage	10/01/2014	16/01/2014
PTE enlargement	12/06/2014	10/08/2014

Table 2 – Construction Activities associated to Section E.

#### C.1.2 Resulting Movements

The monitoring data for the extensometer is shown in Appendix B.

- Compensation grouting from Butcher's Ramp Shaft caused 2mm maximum of heave from 26-04-2013 to 24-07-2013.
- EB TBM caused 2-3mm of settlement from 10-01-2014 to 16-01-2014.
- PTE enlargement works caused maximum 18-20mm of settlement between 12-06-2014 and 10-08-2014.
- Maximum settlement at the end of the works was 24mm.

## **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 devices. No triggers have been defined for the instrument included in this report.

## **C.3 Significant Issues with the Instrumentation**

No issues with this device.

## **C.4 Residual Risks**

As per C435-PMI-00549 the Long Term Monitoring has been ceased by Contract C435 in this area. The last measurement carried out for this device on 26-08-2015. Long term monitoring will be continued by Crossrail to review long term stability.

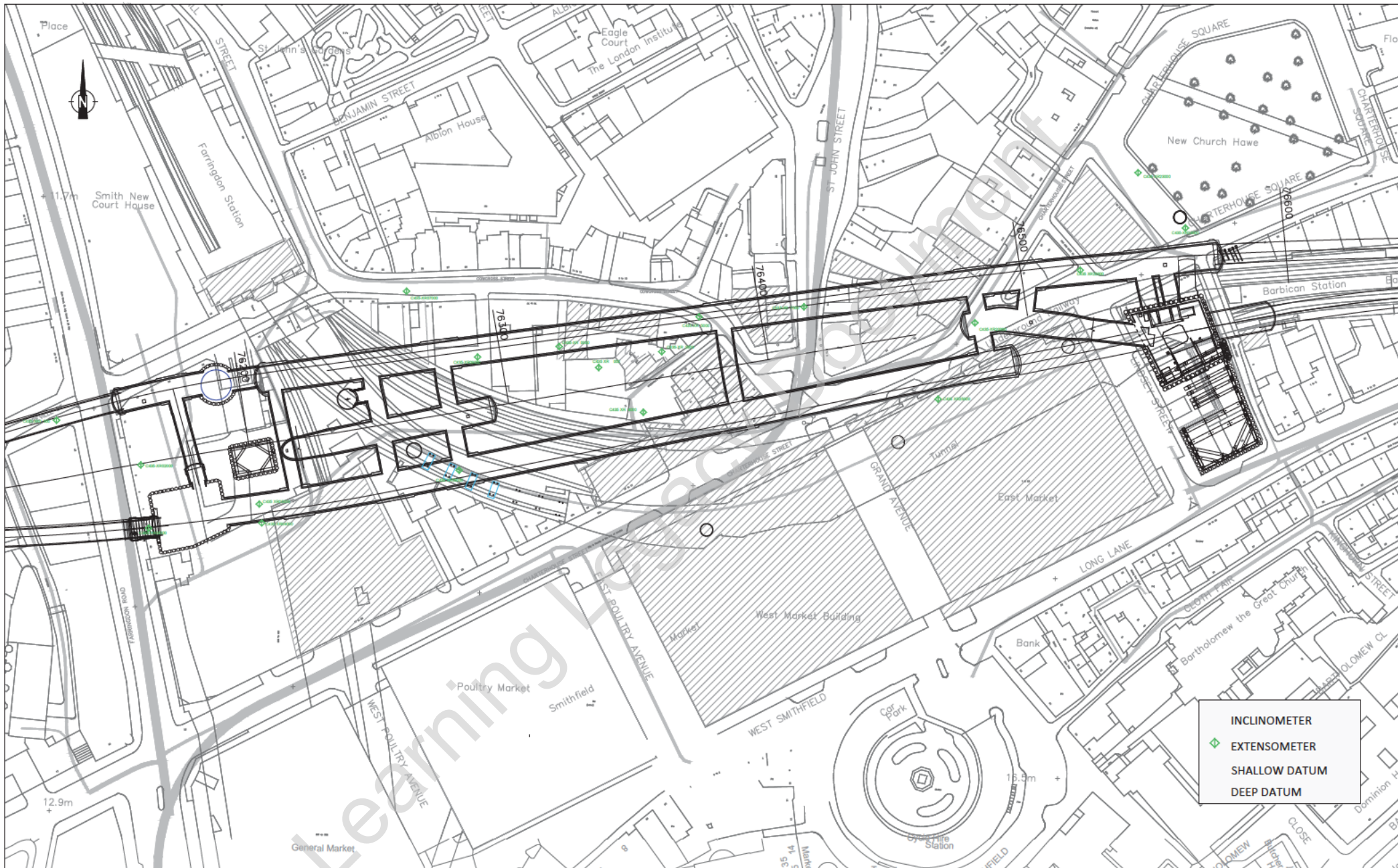
## **D. CONCLUSIONS**

No triggers breached, monitoring stable. No residual risks remain. Long term monitoring to be completed by Crossrail.

APPENDIX A: DRAWINGS

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INCLINOMETER
EXTENSOMETER
SHALLOW DATUM
DEEP DATUM

Notes:

Rev.	Date	Description	By	Chkd	App	Auth
1	15-11-2013					



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Scale : @ A3

Contract :	C435 FARRINGTON STATION
Originator :	GEOCISA
Location :	CROSSRAIL GENERAL
Title :	IN-GROUND DEVICES INSTALLED FOR FARRINGTON STATION.
By :	-
Chk :	-
App :	-
Auth :	
Drq No :	- C435-BFK-C2-DWG-M123-50042
Rev :	
Suit :	

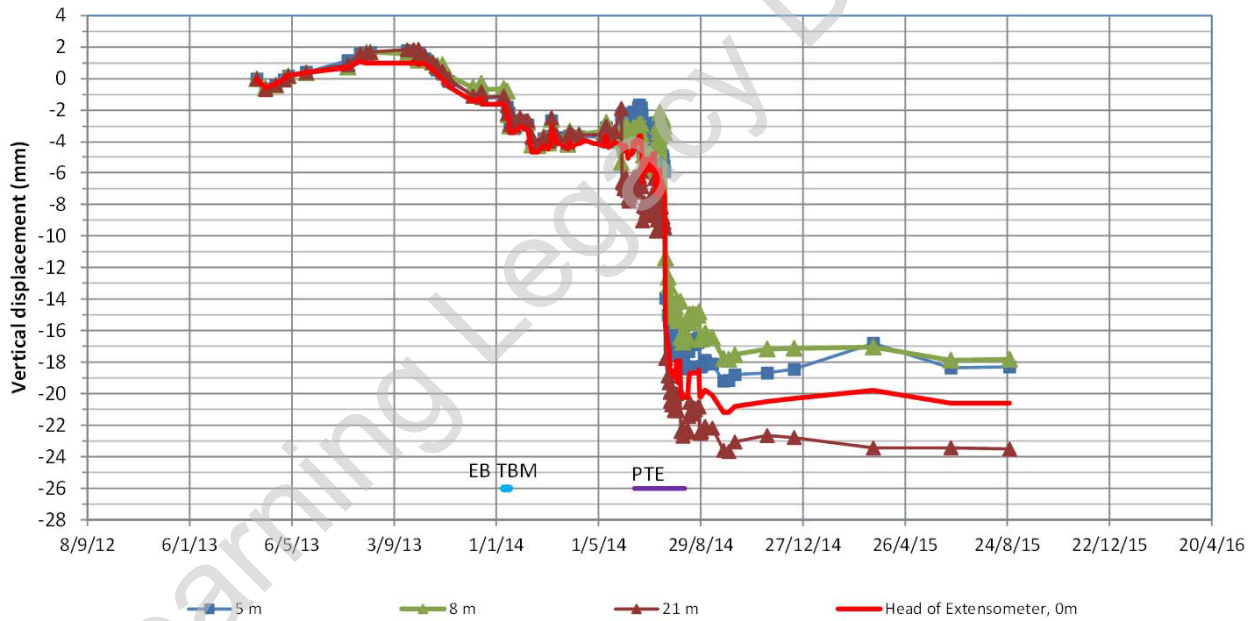
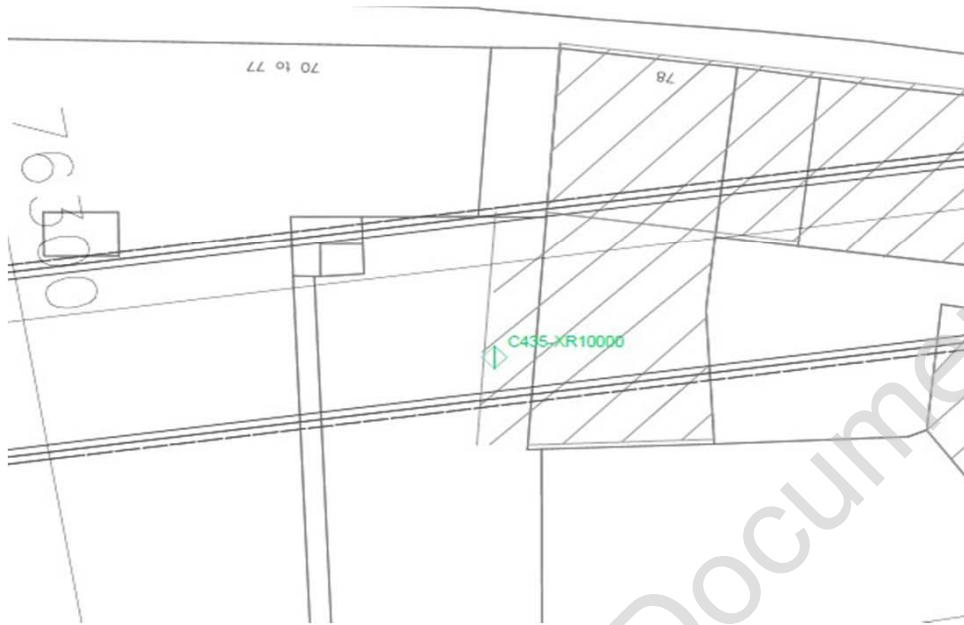
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APPENDIX B: GRAPHS

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**REPORT:** In-ground monitoring  
**AREA:** Alan Baxter  
**DEVICE:** Extensometer



## APPENDIX C: GLOSSARY

- ATS Automatic Total Station.
- ETH Eastern Ticket Hall.
- WB Westbound.
- TBM Tunnel Boring Machine.
- EB Eastbound.
- PTW Platform Tunnel West.
- PTE Platform Tunnel East.
- CP Cross passages.
- CH Concourse Hall.
- VA Ventilation Adit.
- STE Stub Tunnel East
- STW Stub Tunnel West.
- RTE Running Tunnel East.
- ES Escalator.
- TaM Tube a Manchette.

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