

Notes on Movement Monitoring Tottenham House Picture Gallery Alan Baxter Ltd July 2025

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1.00 INTRODUCTION

1.01 This note sets out the proposed strategy for the movement monitoring to be implemented by the Contractor during the Picture Gallery basement works at Tottenham House. The works include the following elements which will result in movements to the existing ground and structures:

- a) Underpinning to the North Elevation of the Main House.
- b) Excavation and installation of the proposed secant piled Picture Gallery basement.
- c) Excavation and installation of a new contiguous piled tunnel to connect the new basement to the Main House.
- d) Excavation and installation of a new shaft to access the tunnel from within the Main House.

2.00 MONITORING PROCEDURE/ REPORTING

2.01 **GENERAL:** The Contractor is to design, install and implement the required monitoring in line with the requirements set out in this note. It remains the Contractor's responsibility to review the monitoring results once they are received and to consider the implications of the recorded movements in relation to the ongoing construction activities. The Contractor is to prepare regular reports summarising their assessment of the movements. These reports, together with the monitoring results, are to be provided to the Contract Administrator (CA) within 3 working days of each monitoring visit being undertaken. In the event that an alert level (see below) being exceeded this is to be reported to the CA immediately and in advance of the Contractor's report.

2.02 **ALERT LEVELS:** The monitoring should be reported against a traffic light system of 'Alert levels' that relate to certain required responses from the Contractor. The levels and actions are to be as follows:

- a) **Green** – The Contractor should review the monitoring and site methodology to confirm reliability of data and any additional mitigating measures to reduce further movement
- b) **Amber** – If the Amber alert level is reached the Contractor is to undertake a detailed review of the monitoring results and report on the site activities that have caused the recorded movements. Their review should consider the rate of movement and anticipated forthcoming activities that may cause further movement. The frequency of monitoring is to be increased to a level which is to be agreed with the CA. The Contractor is to identify and implement measures to mitigate further movements and adopt these as part of their methodology. All such measures being proposed by the Contractor are to be submitted in a report issued to the CA. Following receipt of comments on their proposals the Contractor is to implement the agreed mitigating measures. Furthermore, the Contractor is also to identify the measures they will put in place to arrest the movements should the red alert level be reached and report these to the CA.
- c) **Red** – The Contractor shall immediately cease any site works that may be contributing to the ground movements. The measures agreed at the Amber stage in the event of a red alert shall be implemented. The Contractor is to immediately undertake a review of the construction activities that have led to the movements and issue a report on how they propose to progress with the works to mitigate further movements.

- 2.03 PRIOR TO COMMENCEMENT the Contractor is to submit a method statement for their proposed monitoring at least 2 weeks prior to commencing the monitoring. This should include:
- Example of the graphical presentation format.
 - Clear diagram indicating the direction/notation used in reporting movements
 - A method statement for undertaking the monitoring.
 - Location and any protection measures of proposed monitoring stations and targets for the duration of the works.
 - Method of review.
- 2.04 MONITORING MOVEMENTS: Movements should be measured normal to the plane of the structure being monitored and in the plane of the structure and be presented accordingly. All measurements are to be to an accuracy of +/- 2mm.
- 2.05 ERRONEOUS DATA: If a reading appears to be erroneous, i.e. if the data suggests movements not supported by the surrounding measurements, the Contractor is to re-set up the equipment and immediately re-survey the point in question. If the erroneous result is repeated upon being re-surveyed the Contractor is to investigate the cause. The Contractor's report is to identify any erroneous readings, their cause, and the Contractor's proposals for obtaining reliable monitoring records going forward.

3.00 MONITORING OF EXISTING BUILDINGS

- 3.01 The monitoring includes adjacent existing/listed building of masonry construction. The Contractor is to undertake a photographic survey of all elevations of all buildings on the site and within 15m of the excavations which is to identify any cracks /defects prior to commencement of the works. The Contractor is to undertake a visual survey of the adjacent existing buildings at the same frequency as their other monitoring visits in order to identify any new defects that may arise. Where new cracks form, install tell-tale crack gauges to an agreed specification and monitor on return visits. Generally, visual monitoring can be undertaken from ground level. If new defects arise or existing defects develop access is to be provided to the area for close inspection and review.

4.00 MONITORING POINTS/FREQUENCY

There are minimum requirements for the number/location of monitoring targets and the frequency of surveying the movements. They are as follows.

- 4.01 MONITORING POINTS: The Contractor is to confirm their proposed location of monitoring points on drawings based on the requirements below and their proposed construction methodology.
- On capping beam, over all piles monitoring points to be placed at a maximum of 5m centres.
 - Notwithstanding the previous point, monitoring points should be placed on capping beams at all prop locations.
 - On the Main House North elevation, North Courtyard, and the North Wing/retained façade, points are to be placed at maximum 10m centres on plan. Two points are to be installed at each location; one at low level but at least 1m above ground level, and one at high level within 1m of the top of the wall/structure.
- 4.02 MONITORING FREQUENCY: The monitoring frequency should reflect the works occurring on site. The minimum frequency is as follows.
- Fortnightly prior to commencement of works (minimum of 3 readings).
 - Weekly during underpinning works
 - Weekly during piling or excavations
 - Weekly during construction of basement frame up to lower ground floor slab.
 - Monthly from completion of ground floor slab to completion of structural frame.

5.00 ALERT LIMITS

Alert limits are to be defined on a separate sketch, and will be shared with the Contractor by the CA.

6.00 REPORT PRESENTATION/REQUIREMENTS

- 6.01 The following are general requirements for the presentation of information in the movement monitoring reports:
- a) Reports should be presented in graphical format with the requisite Alert Levels clearly displayed.
 - b) A summary should be provided at the beginning of each report indicating where any movements have exceeded alert levels or erroneous results encountered.
 - c) Date and time of readings.
 - d) Significant construction events that have occurred in the reporting period in the vicinity of the targets.
 - e) Clear diagram indicating the direction/notation used in reporting movements