

Movement Monitoring Specification

For
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at
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PREAMBLE


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1. INTRODUCTION

Articlus has been instructed by UPP on behalf of Dovid Katz to provide a structural monitoring strategy and specification for construction works associated with the redevelopment of 46 Compayne Gardens Hampstead.

A specialist Monitoring Contractor will be procured and will be responsible for the implementation of the monitoring, management of the monitoring data, attending monitoring meetings, and providing factual reports as defined within this specification.

2. PROJECT BACKGROUND

The site is roughly rectangular in shape and comprises an area of approximately 0.06 hectares. The centre of the site is located at approximate National Grid Reference 525915 184501.

The site is currently an unoccupied, derelict three-storey, semi-detached residential property located at 46 Compayne Gardens London.

The site is generally flat and level and located predominately in a residential area. The location of the proposed redevelopment is presented in Figure 1.

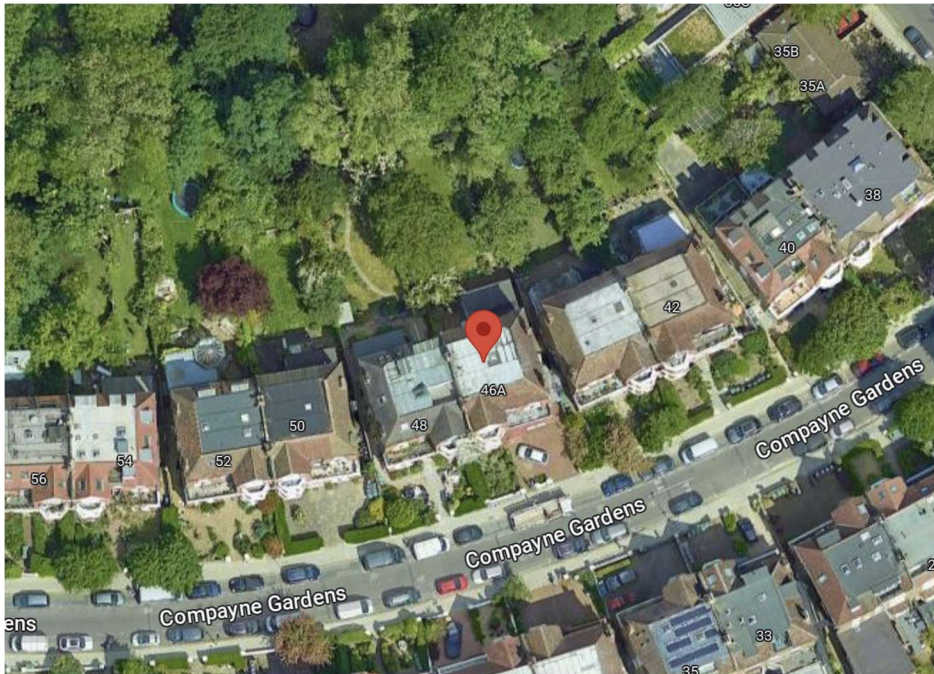



Figure 1: Site location plan (courtesy of google maps)

3. PURPOSE AND SCOPE

The purpose of this document is to specify the monitoring regime for the adjacent building covered under party wall award for the proposed development, in order for it to be procured, installed, and recording movement data

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before, during, and after the proposed construction works. The document will describe the monitoring works, data collection, analysis and reporting.

4. MAIN RESPONSIBILITIES

The Monitoring Contractor shall have the primary responsibility for the instrumentation and monitoring works and shall report directly to the Client or Client's nominated personal/main contractor, who shall forward the results of the monitoring to the Project Manager, the Designer (Articlus), and all other interested parties in a timely manner and shall undertake a review and assessment of each set of monitoring results. Any necessary actions resulting from the review shall be implemented by the main contractor. The Monitoring Contractor shall report to the main contractor, who shall be responsible for the co-ordination and implementation of the monitoring scheme and advise on any modifications required to the monitoring system.

5. MONITROING REQUIREMENTS

5.1 Conditions of Contract

The Monitoring Contractor shall be appointed in accordance with the agreed terms with the Client.

5.2 Monitoring Works


The works described in this specification comprise:

- The installation of a monitoring system to monitor adjoining buildings at 44 and 48 Compayne Gardens, London. Baseline monitoring is required prior to underpinning works commencing, to ensure repeatability in surveying.
- Data collection from the monitoring instruments, maintenance of the monitoring system and provision of reports of the results at an agreed interval.

5.3 Monitoring Responsibility

The Monitoring Contractor shall be responsible for the following:

- A responsible person familiar with the instrumentation and monitoring to carry out the works.
- Quality assurance of the instrumentation and monitoring undertaken. The Monitoring Contractor shall check all data for errors prior to submission. If a reading appears to be erroneous, the Monitoring Contractor shall: identify the cause of any error; notify the main contractor/client; re-monitor the target or instrument in question; install additional monitoring equipment to replace the damaged instruments, if that is the case.

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- The installation of the monitoring targets or points, the reading of the targets and instruments and any additional works to check the accuracy. The equipment supplied shall be robust and be adequately protected against levels of interference and environmental conditions expected on a construction site, in public areas, or within operational buildings.
- Issue reports with numeric and graphical data and circulate to Articlus (ali.raza@articlus.co.uk) and others as directed.
- The monitoring report should include the comments on the construction activities happening on the site at the time of taking the readings. This will help is correlating those with the movement trends.
- The reporting of the data to the main contractor.
- Maintaining all data files and calculations associated with these for the duration of the contract.
- Rectify any faults or damage to the instrumentation system for the duration of the contract.

Advise on a contingency sum for the replacement of damaged instruments:

The Client/main contractor shall be responsible for the following:

- Obtaining all permissions required for the installation of monitoring targets on adjoining building.
- Ensuring that the targets can be read at the specified periods.
- Checking the accuracy of the readings with respect to ongoing site activities.
- Instructing on the installation of additional instrumentation where required through damage etc., and on additional monitoring where doubt exists on the available data.
- Reporting and implementing previously agreed contingency measures
- Ensuring that all processed data and reporting is presented in a manner readily understood by all parties.
- Protecting all monitoring locations specified in this document.


5.4 Monitoring Strategy

Measurements shall be recorded with the following instrumentation:

- Measurement of building movements through reflective survey targets attached to the façade of structure.
- Crack monitoring of existing cracks shall be undertaken using crack meters. The number of crack meters shall be determined following the agreement of condition surveys with party wall surveyors.
- The Client/main contractor shall identify a contingency sum of money for additional monitoring works required as the project develops, at critical time periods, or following the development of damage on structure around the site.

5.5 Monitoring System

The indicative locations of the baseline requirements are shown on the Figure 2. The Monitoring Contractor may only vary the system subject to agreement with Articlus. The system shall be as follows:

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- Reflective targets as shown in the Figure 2 for measurement of horizontal and vertical displacement. Similar array of targets on the House No.48 detached façade as House No. 44 shown in Figure 2.
- Crack meters for crack monitoring at locations to be agreed following condition surveys and with the agreement of the party wall surveyors allocated for the property.

The supply, installation, and monitoring of all instrumentation shall be the responsibility of the Monitoring Contractor and shall be suitable for its specified purpose.

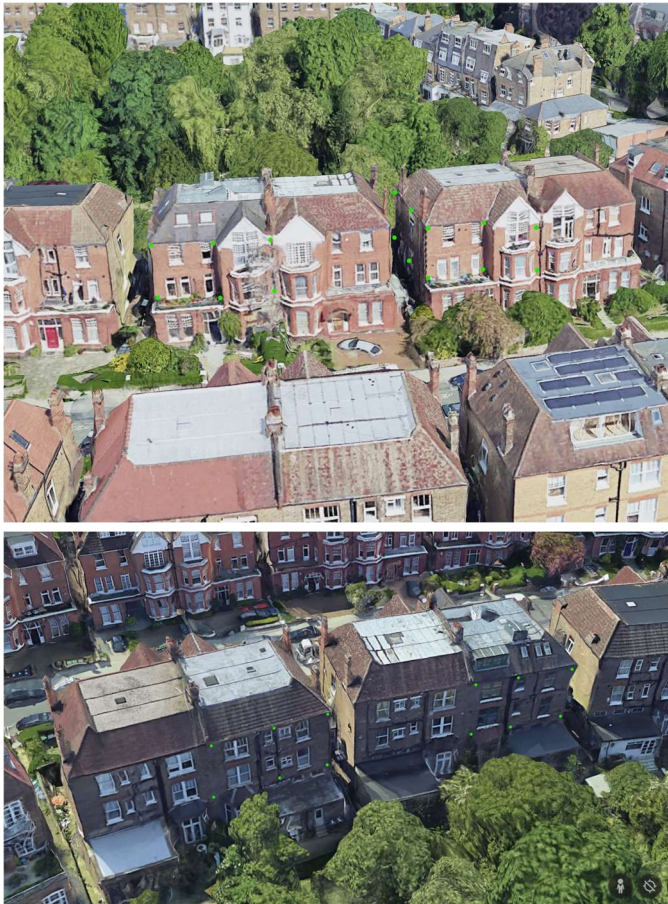



Figure 2: Proposed monitoring locations on adjacent building façades (image courtesy of google earth).

6. MONITORING FREQUENCY

The following minimum monitoring frequency shall be adopted. The Monitoring Contractor should also provide a baseline monitoring report. All results should be presented in graphical format so that trends can be readily identified.

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Instrument	Underpinning Stage	Excavation Station	Superstructure Construction
Targets on building	Weekly	Weekly	Monthly
Crack meters	Weekly	Weekly	Monthly

7. REPORTING

The reports should follow the monitoring frequency provided in Section 6. All results should be presented in graphical format so that trends can be readily identified. The Monitoring Contractor should also provide a baseline monitoring report. A final report shall be prepared within 4 weeks of completion of the monitoring for adjacent building. This report should collate all of the data undertaken during monitoring contract, include status of monitoring equipment and summarises all equipment to be removed.

8. TRIGGER LEVELS

A traffic light system will be used to control the works at the site and the following strategy is to be adopted during the construction works.

- Green: continue as planned.
- Amber: Increase monitoring frequency and prepare a revised plan of work.
- Red: the works would be reviewed and the revised plan of work would be implemented by the main contractor. A formal assessment of the results by the engineer to be prepared and submitted to the party wall surveyors and actions proposed.

Vertical Movement Trigger Limits – Building No 44

Underpinning Stage


Location	Max	Green	Amber	Red
Targets on building	4mm	2	3	4
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Excavation Stage

Location	Max	Green	Amber	Red
Targets on building	7mm	3	5	7
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Long Term Loading Stage

Location	Max	Green	Amber	Red
Targets on building	12mm	6	9	12
Crack width	<1mm	<1mm	<1mm	<1mm

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Vertical Movement Trigger Limits – Building No 48

Underpinning Stage

Location	Max	Green	Amber	Red
Targets on building	6mm	3	5	6
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Excavation Stage

Location	Max	Green	Amber	Red
Targets on building	14mm	7	9	13
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Long Term Loading Stage

Location	Max	Green	Amber	Red
Targets on building	17mm	8	12	16
Crack width	<1mm	<1mm	<1mm	<1mm

Horizontal Movement Trigger Limits – Building No 44

Underpinning Stage

Location	Max	Green	Amber	Red
Targets on building	1mm	1	1	1
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Excavation Stage

Location	Max	Green	Amber	Red
Targets on building	4mm	2	3	4
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Long Term Loading Stage

Location	Max	Green	Amber	Red
Targets on building	5mm	3	4	5
Crack width	<1mm	<1mm	<1mm	<1mm


Horizontal Movement Trigger Limits – Building No 48

Underpinning Stage

Location	Max	Green	Amber	Red
Targets on building	1mm	1	1	1
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm

Excavation Stage

Location	Max	Green	Amber	Red
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Targets on building	5mm	3	4	5
Crack width	<0.1mm	<0.1mm	<0.1mm	<0.1mm
Long Term Loading Stage				
Location	Max	Green	Amber	Red
Targets on building	6	3	5	6
Crack width	<1mm	<1mm	<1mm	<1mm

Notes:

- All upward/ heave related ground movements should be recorded as -ve value and any settlements observed should be recorded as +ve value.
- All horizontal ground movements towards excavation should be recorded as +ve value and any movements observed away from excavation should be recorded as -ve value.
- These trigger limits are based on the individual stage ground movements and presented as accumulative movements in each stage.