



MEASUREMENT MONITORING SPECIFICATION

FOR

**GARAGES AT THE REAR OF
26 NEW END SQUARE
LONDON
NW3 1LS**

**CLIENT: URBAN HIGH DEVELOPMENTS LIMITED
PROJECT NO: P3133**

JUNE 2016

1.00 MEASUREMENT MONITORING OF ADJOINING BUILDINGS AND STRUCTURES

1.01 Adjoining Properties

The adjoining properties, (No.20 New End Square, No.26 New End Square, No.42 New End Square, No.7 Flask Walk Cottages) and the Grade II listed Lamp Post shall be monitored for line and level during the demolition, piling, excavation and construction of the basement and lower ground floor at the Garages at the Rear of No.26 New End Square. The monitoring shall be by means of reflective targets, fixed to the adjoining structures, the movements of which shall be measured to an accuracy of +/- 2mm.

1.02 Monitoring Points for the Adjoining properties

The Monitoring Points for the adjoining properties will be positioned as follows:-

- No.20 New End Square: on the South and South-East elevations,
- No.26 New End Square: on the South and West elevations,
- No.42 New End Square: on the East elevation,
- No.7 Flask Walk Cottages: on the North elevation,
- Grade II listed Lamp Post: on the post facing South-East.

The location of the above buildings and post is shown in **Figure 1** below.



Figure 1
Building to be monitored

Annotated Land Survey

The proposed locations of monitoring points are shown in **Figure 2** and **Table 1** below. These locations are to be agreed and confirmed as acceptable by the Monitoring Contractor, Michael Alexander and the Adjoining Owner. Position of targets shall take into consideration the monitoring information requirements and the access available to fix and 'sight' the targets.



Figure 2
Monitoring point location plan

Monitoring Point Reference Number	Building address	Height from ground floor (m)
MP 20-01	No.20 New End Square	eave level
MP 20-02	No.20 New End Square	eave level
MP 20-03	No.20 New End Square	eave level
MP 26-01	No.26 New End Square	eave level
MP 26-02	No.26 New End Square	eave level
MP 26-03	No.26 New End Square	eave level
MP 26-04	No.26 New End Square	eave level
MP 26-05	No.26 New End Square	eave level
MP 42-01	No.42 New End Square	eave level
MP 42-02	No.42 New End Square	eave level
MP 42-03	No.42 New End Square	eave level
MP 07-01	No.7 Flask Walk Cottages	eave level
MP 07-02	No.7 Flask Walk Cottages	eave level
MP 07-03	No.7 Flask Walk Cottages	eave level
MP LP-01	Grade II listed Lamp Post	2.0m

Table 1
Suggested height for Monitoring Points

2.00 RECORDING OF RESULTS

2.01 All readings shall be presented in an electronic format on drawings and schedules and emailed to all interested parties, within 24 hours of taking the reading. The presentation shall provide an absolute value, as well as the relative movement to the previous reading and cumulative movement to the initial reading. Refer to **Table 2** for a suggested format for illustrating monitoring results.

The monitoring results shall also be clearly presented on relevant graphs with axes clearly identified and units displayed. These graphs will illustrate the trigger value limits, to enable quick reading of the monitoring results.

All monitored displacements will be displayed in millimetres.

Monitoring Point	Original Coordinate Readings (m)	Current Coordinate Readings (m)	Difference Between Current and Original Readings (mm)	Difference Between Current and Previous Readings (mm)	Axes
	Date: DD/MM/YY	Date: DD/MM/YY			
MP 20-01					X
					Y
					Z
MP 20-02					X
					Y
					Z
MP 20-xx					X
					Y
					Z

Table 2
Suggested Format for Monitoring Records

2.02 If a cumulative movement of any of the monitoring points reaches the “Trigger Value”, Works shall be stopped and appropriate Action shall be taken. The Action will be dependent on the direction of movement and the activity being carried out at the time.

2.03 An initial set of monitoring readings shall be taken following installation of all target points.

A second set of monitoring readings shall be taken prior to commencement of works. The second set of readings will establish the differences which can be attributed to the accuracy of readings, seasonal variation in the ground conditions, and thermal/moisture movement in the buildings, when no significant works have been carried out.

Subsequent monitoring readings shall be taken at intervals stated in Clause 3.02, which correspond to the relevant construction works occurring at that period of time.

2.04 The monitoring results shall be forwarded by Michael Alexander to the Building Owner’s Surveyor, Adjoining Owner’s Surveyor and his Advising Structural Engineer, within 48 hours of recording.

3.00 CONSTRUCTION PROGRAMME & MONITORING FREQUENCY

3.01 Construction Programme

The main items from the Preliminary Construction Programme are summarised in the Table below. The dates are indicative only, but will be updated to correspond to the latest Construction Programme, when received.

ACTIVITY	START DATE	END DATE
Demolition and preparation	To be confirmed	To be confirmed
Piling	To be confirmed	To be confirmed
Capping Beam and Installation of Props to Capping Beam	To be confirmed	To be confirmed
Excavation	To be confirmed	To be confirmed
Basement Slab	To be confirmed	To be confirmed
Basement Floor Walls & Columns	To be confirmed	To be confirmed
Lower Ground Floor Slab	To be confirmed	To be confirmed
Lower Ground Floor Walls & Columns	To be confirmed	To be confirmed
Garage Floor Slab	To be confirmed	To be confirmed
Upper Floors	To be confirmed	To be confirmed

Construction Programme

3.02 Proposed Frequency of Readings of Monitoring Points on Adjoining Properties and Perimeter Pile Inclinometers

During Construction - commencement of Piling and Underpinning to completion of construction of Lower Ground Floor Slab.

- The readings shall be taken at 2 weekly intervals.

Post Construction:

- A final set of readings shall be taken 4 weeks after completion of construction of ground floor slab.

Monitoring of the proposed capping beam will be carried out daily by the contractor's site engineers, when any significant item of excavation is being carried out.

4.00 INTERPRETATION & ACTION

4.01 Trigger Levels

The following system of control shall be employed. The Trigger value, at which the appropriate action shall be taken, for each section, is given in Clause 4.02

AMBER: Increase monitoring frequency and undertake a detailed review of construction methods. Prepare a revised method of working.

RED: Stop any further excavation. Make safe the excavation. Review monitoring regime and implement revised plan of works.

4.02 The Trigger Levels shall be as follows:

Adjoining Property No.20 New End Square

X-axis (along the plane of the wall)	Amber:	+/- 3 mm
	Red:	+/- 5 mm

Y-axis (perpendicular to the wall)	Amber:	+/- 3 mm
	Red:	+/- 5 mm

Z-axis (level vertically)	Amber:	+/- 3 mm
	Red:	+/- 5 mm

Adjoining Property No.26 New End Square

X-axis (along the plane of the wall)	Amber:	+/- 4 mm
	Red:	+/- 7 mm

Y-axis (perpendicular to the wall)	Amber:	+/- 4 mm
	Red:	+/- 7 mm

Z-axis (level vertically)	Amber:	+/- 4 mm
	Red:	+/- 7 mm

Adjoining Property No.42 New End Square

X-axis (along the plane of the wall)	Amber:	+/- 5 mm
	Red:	+/- 7 mm

Y-axis (perpendicular to the wall)	Amber:	+/- 5 mm
	Red:	+/- 6 mm

Z-axis (level vertically)	Amber:	+/- 4 mm
	Red:	+/- 6 mm

Adjoining Property No.7 Flask Walk Cottages

X-axis (along the plane of the wall)	Amber:	+/- 4 mm
	Red:	+/- 6 mm

Y-axis (perpendicular to the wall)	Amber:	+/- 5 mm
	Red:	+/- 7 mm

Z-axis (level vertically)	Amber:	+/- 4 mm
	Red:	+/- 6 mm

Grade II listed Lamp Post

X-axis (along the plane of the wall)	Amber:	+/- 4 mm
	Red:	+/- 6 mm

Y-axis (perpendicular to the wall)	Amber:	+/- 4 mm
	Red:	+/- 6 mm

Z-axis (level vertically)	Amber:	+/- 3 mm
	Red:	+/- 5 mm

4.03 Action

Any movements which exceed the **Amber** Trigger Levels shall be immediately reported to Michael Alexander.

In the event of movements exceeding the **Amber** Trigger Levels, the proposed frequency of readings of Monitoring Points on the Adjoining Property shall be increased.

Representatives from Michael Alexander and the Adjoining Owner Representatives' shall then meet on site, as soon as practicable, to review the works being carried out, to inspect the property and to decide and agree on the appropriate Action to be taken.

Any movements which exceed the **Red** Trigger Levels shall be immediately reported to Michael Alexander and appropriate action will be agreed and a meeting will be convened with the Adjoining Owners' Representatives.

4.04 Cessation of Works due to Unforeseen Circumstances

If the programme is revised significantly, the Monitoring Regime will be re-evaluated in conjunction with Michael Alexander and the Adjoining Owners' Representatives.