

MONITORING DURING BASEMENT CONSTRUCTION AND TEMPORARY WORKS

- 1.1 Prior to the basement excavation, an external survey control system is to be established around the site. This will be carried out using traditional closed traverse surveying techniques and will involve the setting up of sufficient external control stations to allow monitoring of the existing structure during and after the demolition and the ground works. The control stations are to have co-ordinates which are directly correlated to the building grids and datum levels related to those shown on the Land Survey drawings issued by the Architect. This initial control survey is to be carried out by the Contractor and may be independently checked and verified by the appointed survey contractor.
- 1.2 To monitor the existing structure the Contractor is to install reflective distometer targets at the intersection of the existing floors and columns on a grid not greater than 5m c/c at each existing floor and roof level and/or in critical locations (corners, protruding elements, rails, cornices etc). These targets consist of reflective plastic elements that shall be adhered to the surface of the building and reflect the electromagnetic waves such as those emitted by electromagnetic distance measurement equipment within modern theodolite total survey stations. The targets shall be used as a basis for remote distance measurements. The final locations and number of the targets are to be confirmed by the Contractor to suit specific site conditions and temporary works proposals. Positioning needs to be such that they are not obscured by the temporary steelwork, scaffold access or any sheeting or other protection afforded to the works.
- 1.3 The positions of the monitoring targets are to be measured and their co-ordinates in easting, northing and elevation (E, N, Z) established.
- 1.4 A minimum of 3 No. sets of baseline co-ordinates is to be recorded and checked for control purposes prior to commencement of the excavation.
- 1.5 During the critical excavation and basement works monitoring readings shall be taken weekly (each set of readings separated by at least 4 days) on a minimum of 75% of the fixed targets. The results are to be recorded and the directional change and quantum movement from the controls and previous readings calculated.
- 1.6 Movements of any target position equal to or greater than trigger values from the previous shall be addressed by the Contractor. The Contractor shall advise the Engineer, the Contract Administrator and Party Wall surveyors on the reasons for the movement and advise his proposals to control further movement. Contractor should consider increasing number of monitoring readings to confirm that the movement is not ongoing or modifying works to avoid further movement.
- 1.7 All results are to be issued to the Engineer, Contract Administrator and AO's surveyor and engineer on a weekly / monthly basis.
- 1.8 The monitoring of the existing buildings shall continue after completion of the ground works and basement construction on a monthly basis until the superstructure is tied and the temporary works removed.
- 1.9 The survey equipment to be used and the details of calibration is to be advised to the Engineer prior to work commencing.

2.0 Limits on movement during construction

	Settlement [mm]		Lateral Displacement	
	Trigger	Action	Trigger	Action
Underpinning (survey points to monitoring datum)	7mm	10mm	5mm	7mm
Temporary Works to superstructure	5mm	10mm	3mm	5mm
Ground Movements during construction	5mm	8mm	5mm	7mm

2.1 Movement of survey points to any building must not exceed

Settlement:

Action value: 10mm

Trigger value: 5mm

Lateral displacement:

Action value: 5mm

Trigger value: 4mm

2.2 Movement approaching critical values

Trigger: Submit proposals for ensuring action values are not exceeded

Action: Stop work and inform Structural Engineer and CA immediately and await further instructions