MONITORING PLAN

BASEMENT CONSTRUCTION AT
13 GLOUCESTER CRESCENT
LONDON
NW1 7DS

JAMES FRITH LTD
Consulting Civil and Structural Engineers

Report No: MT0440 August 2019

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13 GLOUCESTER CRESCENT
LONDON
NW1 7DS

Revision	Date	Description	Approved By:
1	05/08/19	First Issue	James Frith MEng CEng MIStructE FGS

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1. INTRODUCTION

1.1 Scope of Works

This monitoring plan covers the proposed works at 13 Gloucester Crescent, London as detailed in MS-DA Ltd and James Frith Ltd drawings. This document shall be read in conjunction with all other contract documentation.

The works comprise formation of a single storey basement to the rear of the property and alterations to the rear facade.

1.2 Topography

Generally the site is level along Gloucester Crescent and across the site. The existing Lower Ground Floors to the properties are below road level.

1.3 Adjacent Structures

Structures adjacent to and under direct influence of the works (within 10m) are No's 12 & 14 Gloucester Crescent.

2. MONITORING PLAN

2.1 Outline Construction Sequence

A basic list of operations is given below

ITEM	DESCRIPTION
A	Soft-strip / demolish internal non-load bearing walls to existing house.
B	Modify drainage
C	Carry out underpinning to existing rear wall and party walls to form new basement at rear
D	Removal and reconstruction of the rear facade at Lower Ground and Ground Floor levels.
E	Internal refurbishment

2.2 Monitoring Procedure

In order to mitigate against damage to existing properties, the whole site and adjacent properties will be monitored for movement. Vertical and horizontal displacements will be recorded at key locations which are shown on drawing 0440 – M001 in Appendix A. Vibration monitoring (where required) is carried out by a specialist contractor.

The critical works that may result in movement are underpinning to the existing walls and removal of load-bearing walls.

For this scale of project a total station with be satisfactory with targets/prisms attached to critical structures and points within and around the site. This will be able to record the vertical and horizontal movements to enable on-going assessment of the works effect on the surrounding structures.

In order to provide an accurate assessment of the movement a baseline movement needs to be established as a majority of the properties in the immediate area of the site were built over 100 years ago and may be subject to movement continuously or have inherent defects. For example, some structures may be continually affected by seasonal movement due to shallow foundations and the high plasticity clay on which they are founded. These baseline moments will be then used when assessing movement when trigger levels are reached.

Ideally baseline movements shall be recorded over a year so that all seasonal effects are known. However, where programme dictates a shorter lead-in, a suitable sized structure (another house) outside the influence of the excavation will be measured over the construction period so that this can be used as the baseline.

2.3 Site Procedure

The Contractor will install targets to the structures as indicated on the drawings and determine suitable locations to position the Total Station to view the targets. Both the targets and Total Station positions shall be organised so that targets can be viewed throughout the entire construction period.

The Contractor will then take weekly readings for a majority of the works duration. During underpinning works these will be taken twice weekly.

The Contractor will take three readings minimum per target to obtain an average and minimise reading errors. These readings will be recorded in a spreadsheet or other suitable format and made available to the Project Team for review and assessment at convenience. A suggested record sheet is provided in Appendix B.

All survey equipment shall be calibrated prior to use and the Contractor's shall employ a competent person experience with the use of the equipment and procedure set out in this plan.

2.4 Trigger Levels & Actioning

The design team and Contractor have agreed the following trigger levels and the resulting actions. Trigger levels are based on net movement and where the rate of movement is increasing after baseline movements have been deducted.

Trigger Level	Action
0 - 2mm	Review of data to become more frequent to determine rate of movement. Project Team to be made aware.
2 - 4mm	Project Team and Contractor to meet to determine if cause of ongoing movement. Daily assessment of data by Project Team. Contractor to review methodology
>5mm	Works to stop on site. Project Team and Contractor to review design and methodology. Temporary propping shall be installed at location(s) where instructed by design team until movement stabilises and a revised methodology has been agreed.

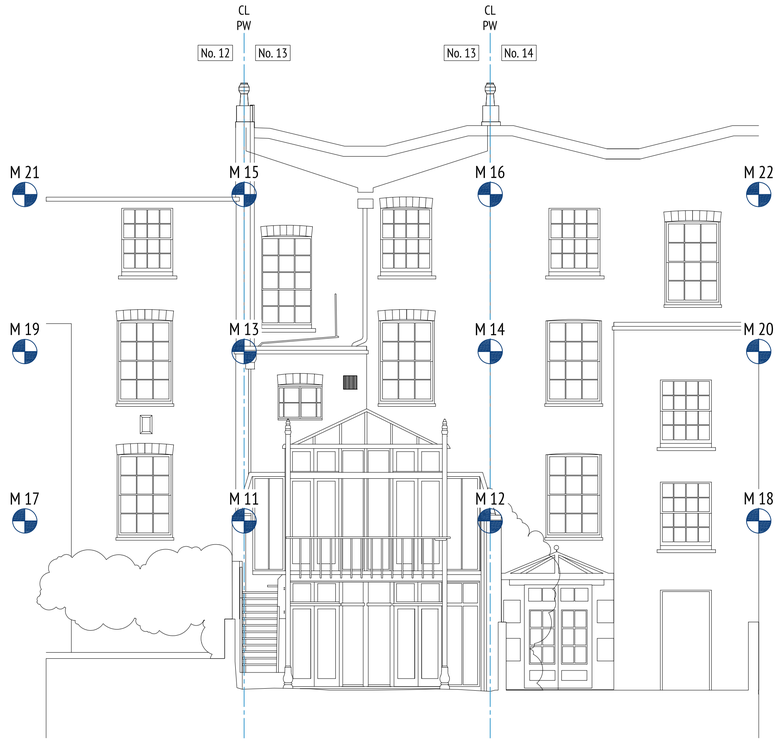
APPENDIX A

DRAWINGS

SCALE: AS SHOWN AT A1

JOB No: 0440 | **REV**
DRAWING No: M001 | A

FRONT ELEVATION



REAR ELEVATION

KEY

M #
MONITORING TARGET / PRISM FIXED TO WALL

MONITORING METHODOLOGY

ALL MONITORING POINTS TO BE SET OUT IN ACCORDANCE WITH THIS DRAWING

STEP 1:
PRIOR TO STARTING WORK ON SITE INSTALL MONITORING TARGETS / PRISMS TO ELEMENTS IDENTIFIED ON DRAWING. OBTAIN BACKGROUND MOVEMENT READINGS FOR BASELINE VERTICAL AND HORIZONTAL DISPLACEMENTS. CONTRACTOR SHALL STORE ADDITIONAL TEMPORARY PROPPING ON SITE

STEP 2:
ONCE CONSTRUCTION WORK BEGINS MEASUREMENTS SHALL BE TAKEN AT THE FOLLOWING FREQUENCIES:
A) DEMOLITION AND SITE CLEARANCE - WEEKLY MEASUREMENTS
B) BASEMENT UNDERPIN / EXCAVATION / CONSTRUCTION - DAILY
C) SUPERSTRUCTURE - BI-WEEKLY
D) FIT-OUT AND FINISHES - WEEKLY

READINGS RECORDED IN TABLATURE FORMAT. A MINIMUM OF THREE READINGS SHALL BE TAKEN PER TARGET TO OBTAIN AN AVERAGE TO MINIMISE ERRORS.

STEP 3:
CONTRACTOR TO MONITOR NET DISPLACEMENTS AFTER EACH READING IS TAKEN AND THE VALUE COMPARED AGAINST THE TABLE BELOW AND THE CORRESPONDING ACTION SHALL BE UNDERTAKEN WHERE APPLICABLE.

STEP 4:
MONITORING TO BE CONTINUED UNTIL WORKS COMPLETED OR WHERE LEVELS STABILISE UPON AGREEMENT WITH THE DESIGN TEAM

MONITORING TRIGGER LEVELS AND PROCEDURE

ALL MONITORING POINTS TO MEASURE VERTICAL AND LATERAL MOVEMENTS
TRIGGER VALUES REPRESENT THE CUMULATIVE MOVEMENT IN ANY DIRECTION

THE FOLLOWING TRIGGER LEVELS HAVE BE SET:

TRIGGER LEVEL SCHEDULE		
LEVEL	RANGE	ACTION
1	0 - 2mm	NO ACTION
2	2 - 5mm	REVIEW OF DATA TO BECOME MORE FREQUENT TO DETERMINE RATE OF MOVEMENT. PROJECT TEAM TO BE MADE AWARE CONTRACTOR TO CHECK METHODOLGY/PROCUDURE.
3	>5mm	WORKS TO STOP ON SITE. PROJECT TEAM AND CONTRACTOR TO REVIEW DESIGN AND METHODOLOGY. ADDITIONAL TEMPORARY WORKS TO BE INSTALLED WHERE REQUIRED. WORKS NOT TO CONTINUE UNTIL MOVEMENT RANGE STABILISES AND REVISED METHODOLOGY AGREED

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PROJECT: 13 GLOUCESTER CR

TITLE: MONITORING POINTS

STATUS: FOR INFORMATION

CLIENT: PRIVATE

APPENDIX B

Monitoring Record Sheet

Target No	Reading relative to Bench Mark	DATE																			
		04-02-19		Change	11-02-19		Change	18-02-19		Change	25-02-19		Change	04-03-19		Change	11-03-19		Change	18-03-19		Change
		AM	PM		AM	PM		AM	PM		AM	PM		AM	PM		AM	PM		AM	PM	
M 01	Vertical Reading																					
	Horizontal Reading																					
M 02	Vertical Reading																					
	Horizontal Reading																					
M 03	Vertical Reading																					
	Horizontal Reading																					
M 04	Vertical Reading																					
	Horizontal Reading																					
M 05	Vertical Reading																					
	Horizontal Reading																					
M 06	Vertical Reading																					
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M 07	Vertical Reading																					
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M 08	Vertical Reading																					
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M 09	Vertical Reading																					
	Horizontal Reading																					
M 10	Vertical Reading																					
	Horizontal Reading																					