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# RESULTS OF A 24 HOUR NOISE LEVEL SURVEY

# CARRIED OUT AT THE FRONT AND REAR OF

# No. 4 TAVISTOCK PLACE, LONDON WC1

# AND THE SUITABILITY OF THE BUILDING FOR RESIDENTIAL DEVELOPMENT AGAINST

# THE GUIDELINES OF THE LOCAL COUNCIL'S DEVELOPMENT MANAGEMENT POLICIES

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Authorised for
Release by :

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| | | |
|---|---|---|
| Client | : | Marek Wojciechowski Architects |
| Project | : | No. 4 Tavistock Place, London WC1 |
| Emtec Ref. | : | QF8149/PF5337/RP1 |
| Issue Date | : | 14th January 2015 |
| Rev. | : | 'B' – 24th November 2015 |

# RESULTS OF A 24 HOUR NOISE LEVEL SURVEY CARRIED OUT AT THE FRONT AND REAR OF No. 4 TAVISTOCK PLACE, LONDON WC1 AND THE SUITABILITY OF THE BUILDING FOR RESIDENTIAL DEVELOPMENT AGAINST THE GUIDELINES OF THE LOCAL COUNCIL'S DEVELOPMENT MANAGEMENT POLICIES

## 1.0. INTRODUCTION

This report details the results of a 24-hour noise level survey carried out on the first floor front balcony and the fifth floor rear flat roof of No. 4 Tavistock Place, London WC1

The proposed development, which includes the erection of an extension at roof level, is to renovate the existing building to create 9 no. self-contained residential apartments.

The objectives of this survey were as follows:

- To assess the proposal that is to develop the existing site into a residential building which includes a fifth floor roof extension.

- To establish the existing background noise level at the property.

- To assess the building against the guidelines of the local councils 'Development Management Policies' and rate of the site as to its suitability for residential development.

This report has been divided into the following sections for ease of analysis:

## 2.0. SITE DESCRIPTION

No. 4 Tavistock Place is a five storey mid terrace commercial property located in the Saint Pancreas area of Central London. The front door to the property leads directly out on to the pavement via steps, whilst the rear of the property overlooks parking spaces associated with residential property Thackeray House behind. On either side of No. 4 Tavistock Place are commercial properties which appear to be very similar in size and shape.

See photo 'A' in appendix B of this report for the existing site layout.

## 3.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:2014 "Methods for Rating and Assessing Industrial and Commercial Sound". Details of the equipment are as follows:

| | |
|---|---|
| Integrating Sound Level Meter: | Rion type NL-52 class 1 Sound Level Meter fitted with a Rion type UC-59 ½ inch condenser microphone. Serial No.: 01121378 and 01121380. |
| Statistical Analysis Modules: | Built in module capable of computing the percentile levels L1, L10, L50, L90 and L99 and also the Leq level. |
| Acoustic Calibrator: | Bruel & Kjaer type 4231 electronic calibrator. Serial No.: 1934160 |

Calibration was performed before and after the surveys, using a reference noise level of 94dBA, and found to be in all cases, +/- 0.1 dB from the reference source.

### 3.1. Existing Noise Climate

Road traffic travelling on Tavistock Place could be heard during the manned periods at the start and the end of the survey, so the noise levels measured will include contributions from road vehicles.

Commercial jet aircraft were observed at medium and high altitude during the manned periods at the start and the end of the survey, so it is possible that the noise levels measured could include contributions from medium altitude jet aircraft.

There were no other noticeable noise sources heard during the 24-hour noise survey period i.e. construction work.

We judged that road traffic noise to be the dominant source of noise affecting ambient noise levels.

## 4.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 12.05pm on Monday the 12th January 2015 to 12.05pm on Tuesday the 13th January 2015.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 15 minutes. The following 'A' weighted statistical measurements were recorded concurrently: -

$LA_1$ - The Sound Pressure Level exceeded for 1% of the measurement period.

$LA_{10}$ - The Sound Pressure Level exceeded for 10% of the measurement period.

$LA_{50}$ - The Sound Pressure Level exceeded for 50% of the measurement period.

$LA_{90}$ - The Sound Pressure Level exceeded for 90% of the measurement period. LA90 is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142:1997).

$LA_{99}$ - The Sound Pressure Level exceeded for 99% of the measurement period.

$LA_{eq}$ - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

### 4.1. Measurement Positions

Noise levels were measured on the first floor front balcony and on the fifth floor rear flat roof, in positions considered equivalent to the closest receptor properties in order to enable noise predictions from the proposed plant to be compared and assessed against.

The microphones were pointing vertically and were approximately 1.2 metres above roof level. The rest of the measurement equipment was located in a weatherproof enclosure with a low impedance cable running from the microphone to the instrumentation.

Photos 'B' & 'C' in appendix 'B' of this report show the microphone locations.

### 4.2. Weather Conditions

The weather conditions prevailing during the measurement period were generally in line with those recommended in BS 4142:1997: -

| | | | |
|---|---|---|---|
| Weather daytime: - | Dry | Weather night time: - | Dry |
| Wind daytime: - | Light | Wind night time: - | Light |

The microphone was protected throughout the tests by an acoustically transparent wind balloon.

### 4.3. Assumptions

It has been assumed that the noise levels measured during the 24-hour survey period represent the typical daily ambient noise levels of the neighbourhood.

## 5.0. RESULTS AND EVALUATION OF NOISE CRITERIA

The raw test data, gathered during the noise survey, is given in Appendix 'A 'of this report.

The 'A' Weighted Leq levels measured over each 15 minute interval throughout the 24-hour period (denoted by $LA_{eq}$, (15 mins)) are displayed as a line graph on the attached Sketch No QF8149/T1/A & QF8149/T1/B at the back of this report.

The 'A' Weighted percentile levels measured over each 15 minute interval denoted by $LA_{10}$ (15 mins), $LA_{50}$ (15 mins) and $LA_{90}$ (15 mins) are displayed as line graphs on the attached Sketch No QF8149/T2/A & QF8149/T2/B at the back of this report.

### 5.1. Summary of Results

The tables QF/8149/D1 and QF/8149/D2 summarises the noise levels taken over the 24-hour period in terms of the maximum and minimum Sound Pressure Levels recorded on the first floor front balcony and fifth floor rear flat roof of the property.

Table QF/8149/D1 – Summary of Maximum and Minimum Noise Levels (Front Balcony)

| | $LA_{eq}$ | $LA_1$ | $LA_{10}$ | $LA_{50}$ | $LA_{90}$ | $LA_{99}$ |
|---|---|---|---|---|---|---|
| Minimum | 59dBA | 70dBA | 63dBA | 53dBA | 49dBA | 47dBA |
| Maximum | 74dBA | 84dBA | 76dBA | 71dBA | 65dBA | 61dBA |

Table QF/8149/D2 – Summary of Maximum and Minimum Noise Levels (Rear Roof)

| | $LA_{eq}$ | $LA_1$ | $LA_{10}$ | $LA_{50}$ | $LA_{90}$ | $LA_{99}$ |
|---|---|---|---|---|---|---|
| Minimum | 43dBA | 48dBA | 44dBA | 42dBA | 41dBA | 41dBA |
| Maximum | 57dBA | 71dBA | 58dBA | 54dBA | 52dBA | 51dBA |

## 6.0. DISCUSSION OF RESULTS

At the front of the property the results show a fairly typical pattern for noise levels in a mixed use area of London when compared to the results of other surveys conducted in nearby residences. However at the rear of the property noise levels increase around the time periods 23.30pm, 02.46am and 04.30am, we are unable to confirm if these are 1 off events or if they are a regular occurrence.

### 6.1. Suitability of Building for Residential Use

Whilst the Planning Policy Guidance PPG24 has been replaced by the National Planning Policy Framework, Camden Council still use the same NEC categories for assessing noise levels for new dwellings.

The Planning Policy Guidance PPG24 gives guidelines to local planning authorities with regard to the suitability of incoming developments onto sites that are exposed to high levels of existing environmental noise such as road traffic, rail or aircraft noise.

The guidance notes establish a noise exposure category (NEC) for the site in question and these categories fall into one of four types (A; B; C & D). NEC-A is a quiet environment where noise need not be considered a determining factor for granting planning permission. NEC-B considers that noise should be taken into account and conditions imposed to ensure that adequate protection against noise are included in the design of the project. NEC-C considers that planning permission should not normally be granted but if permission is given because no alternative site is available then conditions must be imposed to ensure so that protection is provided against high noise level. NEC-D considers that planning permission should normally be refused.

The average $LA_{eq}$ noise levels measured at the front of the building over the 24 hour noise level survey equate to the following figures:

| Time Period | Average $LA_{eq}$ |
|---|---|
| Daytime (7:00am to 23:00pm) | 69dBA |
| Category for mixed sources of noise (7:00am to 23:00pm) | Category C |
| Nightime (23:00pm to 7:00am) | 64dBA |
| Category for mixed sources of noise (23:00pm to 7:00am) | Category C |

Note: Front of building Average $LA_{eq}$ noise levels used due to worst case scenario.

The above table shows that the average $LA_{eq}$ over the daytime and nightime periods fall into Category C which therefore requires that planning permission should not normally be granted. Where it is considered that permission should be given, for

example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.

The building should be designed to achieve the following internal noise levels as recommended by the World Health Organisation:

35dB $LA_{eq}$(16): daytime (7:00am to 23:00pm) to prevent interference of speech and moderate annoyance.

30dB $LA_{eq}$(8): nightime (23:00pm to 7:00am) to prevent sleep disturbance.

Using the lower noise level of $LA_{eq}$: 30dB as the design requirement within the bedrooms of the development it will be necessary to construct the envelope of the new building with an as built minimum mean noise reduction capability of at least 34dB (100Hz to 3150Hz). Particular attention should be made to the glazing which will necessitate being well sealed double glazing units with substantial glass weight and adequate intermediate air gaps as well as acoustically efficient peripheral seals.

6.2. Summary

A 24-hour noise level survey has been undertaken at No. 4 Tavistock Place, London WC1.

A PPG24 assessment has been undertaken at No. 4 Tavistock Place, London WC1 and an NEC Category C has been designated for both day and night time.

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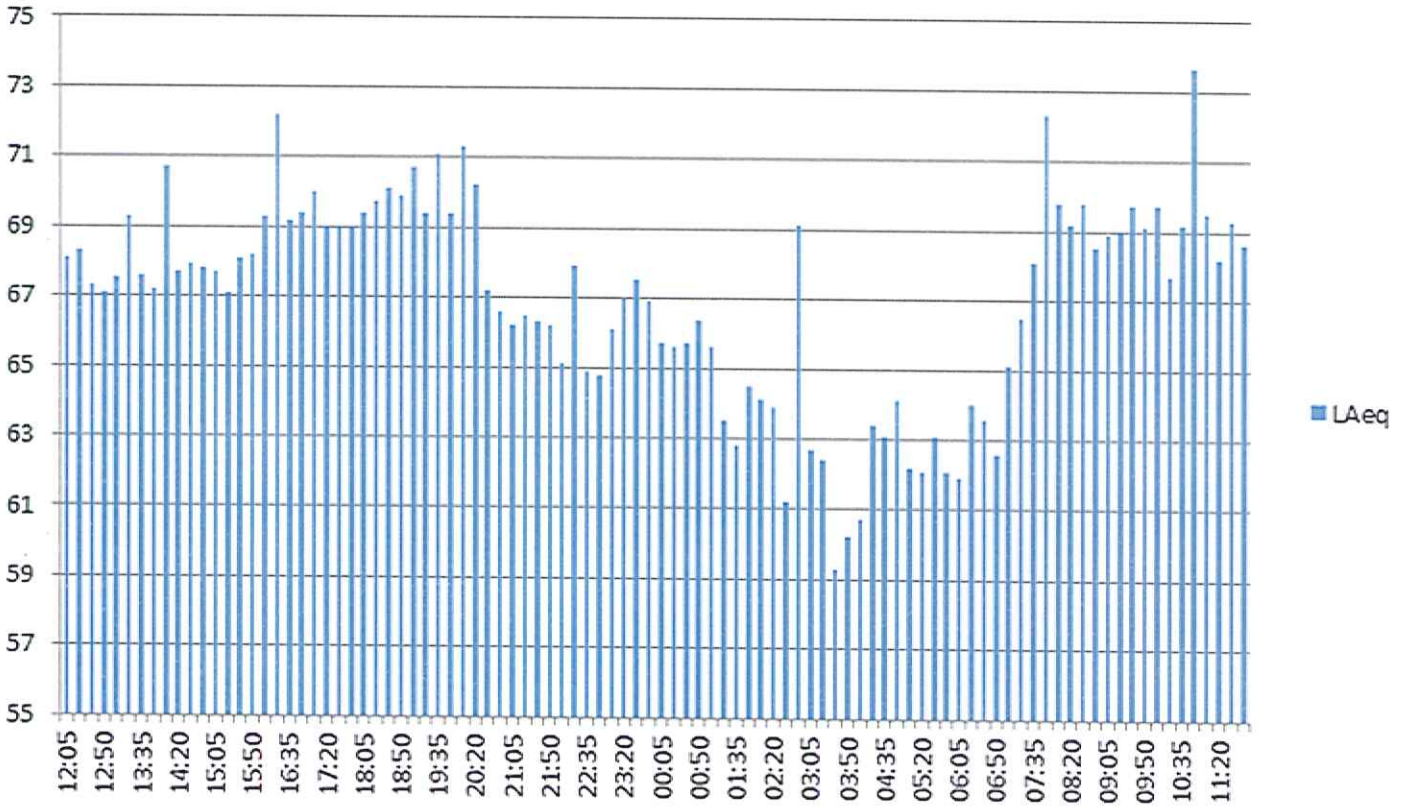
**24th November 2015**




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TITLE: LAeq Levels- 1st Floor Balcony - Front* | *ISSUE DATE:* 14/1/15 | | | | *DRAWN Y:* CH | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* |
| *CLIENT: Marek Wojciechowski Architects* | *PF No: 5337* | | | | *APPROVED BY:* JRT | *REVISION* | | | | | | | |
| *PROJECT: 4 Tavistock Place, London WC1* | *Q* | *A* | *M* | *I* | *DESIGN AUTH:* CH | *SKETCH No. QF/8149/T1/A* | | | | | | | |

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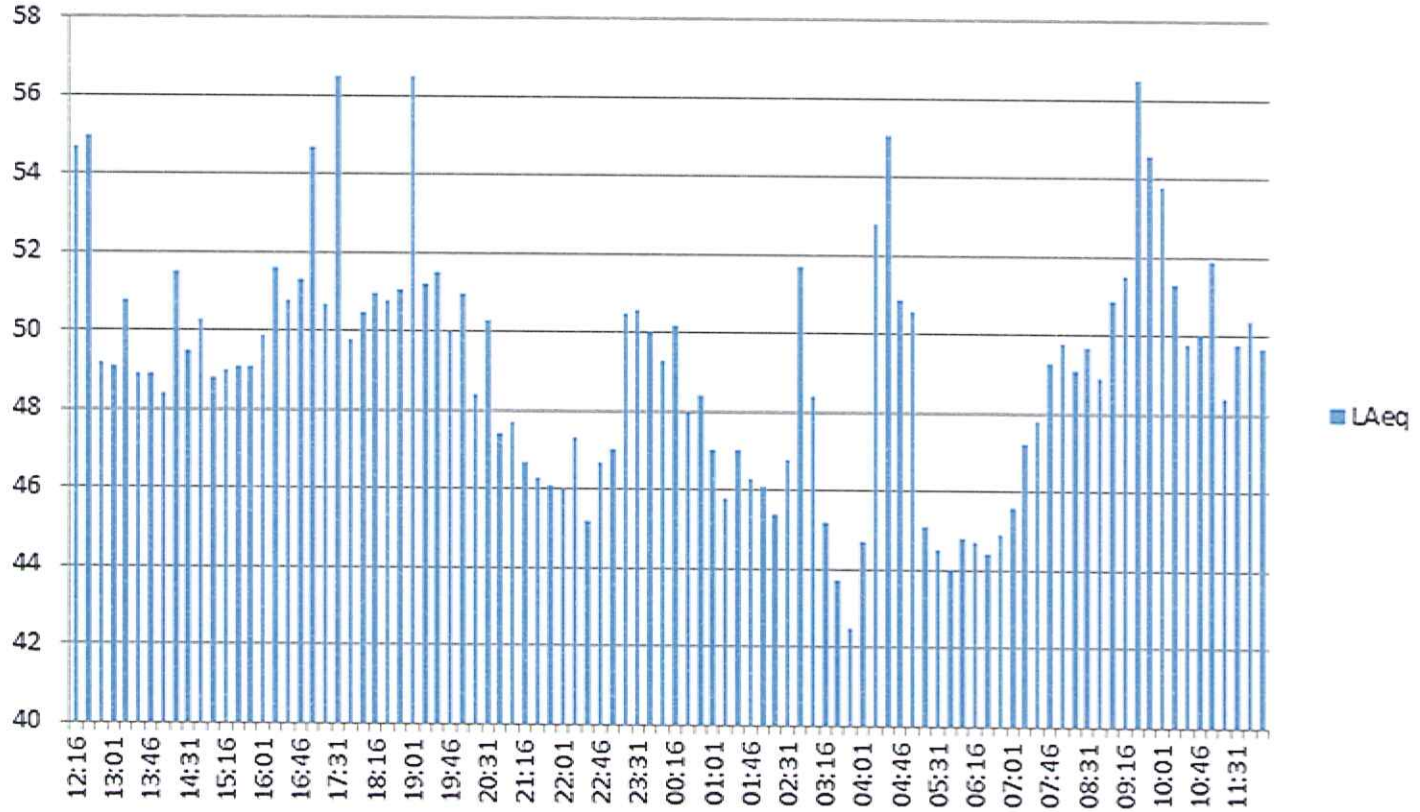


| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TITLE: LAeq Levels – 5th Floor Flat Roof - Rear | ISSUE DATE: 14/1/15 | | | | DRAWN Y: CH | A | B | C | D | E | F | G | H |
| CLIENT: Marek Wojciechowski Architects | PF No: 5337 | | | | APPROVED BY: JRT | REVISION | | | | | | | |
| PROJECT: 4 Tavistock Place, London WC1 | Q | A | M | I | DESIGN AUTH: CH | SKETCH No. QF/8149/T1/B | | | | | | | |

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| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TITLE: LA10; LA50 & LA90 Levels<br>1st Floor Balcony - Front | ISSUE DATE: 14/1/15 | | | | DRAWN Y: CH | A | B | C | D | E | F | G | H |
| CLIENT: Marek Wojciechowski Architects | PF No: 5337 | | | | APPROVED BY: JRT | REVISION | | | | | | | |
| PROJECT: 4 Tavistock Place, London WC1 | Q | A | M | I | DESIGN AUTH: CH | SKETCH No. QF/8149/T2/A | | | | | | | |

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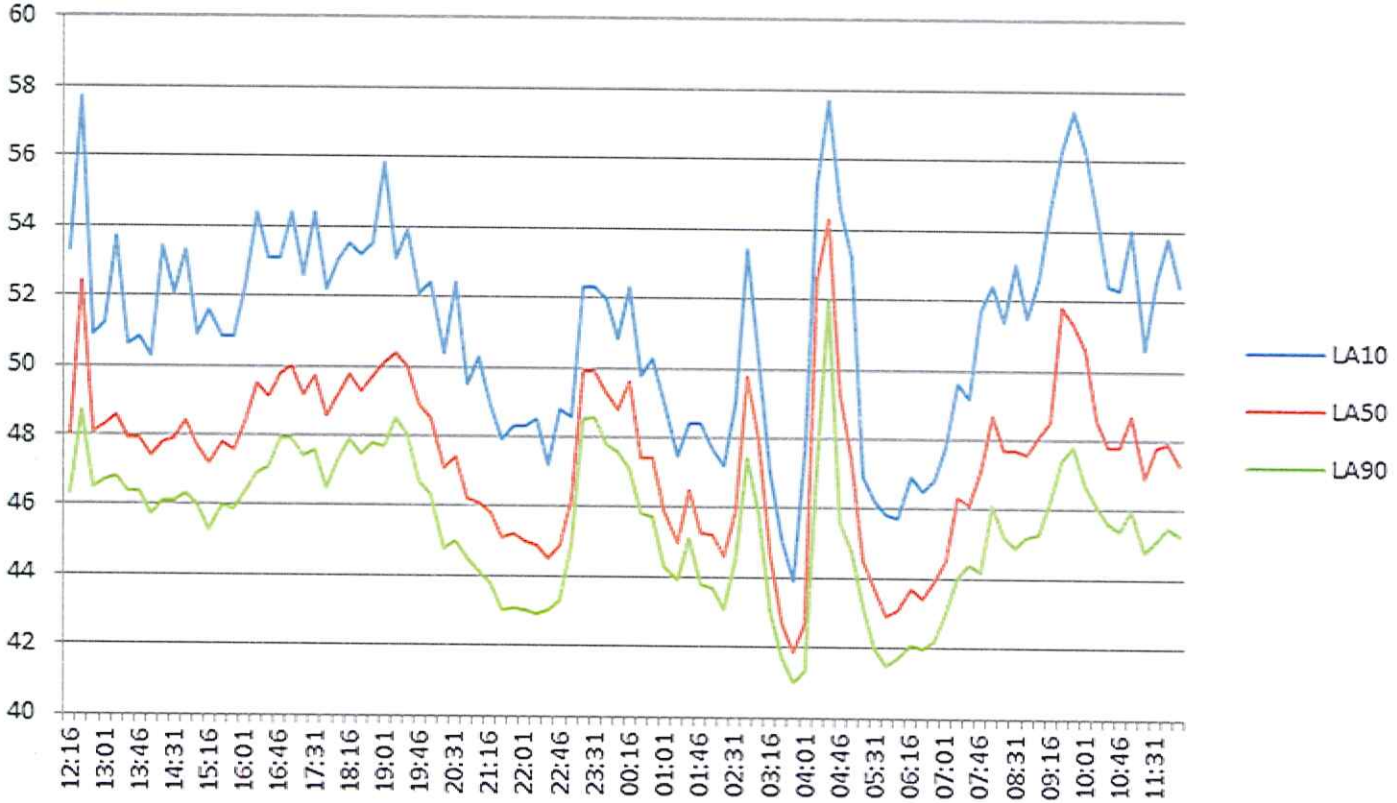


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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *TITLE: LA10; LA50 & LA90 Levels 5th Floor Flat Roof - Rear* | *ISSUE DATE:* 14/1/15 | | | | *DRAWN Y:* CH | *A* | *B* | *C* | *D* | *E* | *F* | *G* | *H* |
| *CLIENT: Marek Wojciechowski Architects* | *PF No: 5337* | | | | *APPROVED BY:* JRT | *REVISION* | | | | | | | |
| *PROJECT: 4 Tavistock Place, London WC1* | *Q* | *A* | *M* | *I* | *DESIGN AUTH:* CH | *SKETCH No. QF/8149/T2/B* | | | | | | | |

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# APPENDIX 'A'

Raw Data – Noise Survey

12th to 13th January 2015

RAW NOISE DATA - 4 Tavistock Place, London, WC1 - (1st Floor Balcony - Front)

**Client:** Marek Wojciechowski Architects
**Ref:** QF8149/PF5337/RP1
**Date:** 12th to 13th January 2015

| Address | Start Time | LAeq | LE | Lmax | Lmin | LA1 | LA10 | LA50 | LA90 | LA99 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12:05 | 68 | 98 | 87 | 55 | 78 | 71 | 65 | 60 | 57 |
| 2 | 12:20 | 68 | 98 | 87 | 56 | 77 | 71 | 66 | 61 | 57 |
| 3 | 12:35 | 67 | 97 | 88 | 55 | 75 | 71 | 65 | 60 | 57 |
| 4 | 12:50 | 67 | 97 | 78 | 54 | 74 | 71 | 65 | 60 | 56 |
| 5 | 13:05 | 68 | 97 | 84 | 56 | 75 | 71 | 65 | 60 | 57 |
| 6 | 13:20 | 69 | 99 | 92 | 57 | 79 | 72 | 65 | 61 | 58 |
| 7 | 13:35 | 68 | 97 | 79 | 56 | 75 | 71 | 65 | 61 | 58 |
| 8 | 13:50 | 67 | 97 | 79 | 57 | 75 | 71 | 65 | 61 | 59 |
| 9 | 14:05 | 71 | 100 | 93 | 56 | 82 | 72 | 65 | 60 | 58 |
| 10 | 14:20 | 68 | 97 | 82 | 57 | 75 | 71 | 66 | 61 | 58 |
| 11 | 14:35 | 68 | 98 | 89 | 56 | 76 | 71 | 65 | 61 | 58 |
| 12 | 14:50 | 68 | 97 | 82 | 58 | 75 | 71 | 66 | 62 | 60 |
| 13 | 15:05 | 68 | 97 | 85 | 56 | 75 | 71 | 65 | 61 | 57 |
| 14 | 15:20 | 67 | 97 | 79 | 55 | 75 | 71 | 65 | 59 | 57 |
| 15 | 15:35 | 68 | 98 | 86 | 55 | 77 | 72 | 65 | 60 | 56 |
| 16 | 15:50 | 68 | 98 | 83 | 56 | 76 | 72 | 66 | 60 | 57 |
| 17 | 16:05 | 69 | 99 | 84 | 57 | 76 | 74 | 67 | 61 | 58 |
| 18 | 16:20 | 72 | 102 | 93 | 57 | 84 | 74 | 67 | 62 | 58 |
| 19 | 16:35 | 69 | 99 | 80 | 56 | 77 | 73 | 67 | 63 | 58 |
| 20 | 16:50 | 69 | 99 | 83 | 56 | 77 | 73 | 67 | 61 | 58 |
| 21 | 17:05 | 70 | 100 | 78 | 57 | 77 | 74 | 68 | 63 | 59 |
| 22 | 17:20 | 69 | 99 | 81 | 57 | 76 | 73 | 67 | 62 | 58 |
| 23 | 17:35 | 69 | 99 | 81 | 55 | 76 | 73 | 67 | 61 | 56 |
| 24 | 17:50 | 69 | 99 | 80 | 55 | 76 | 73 | 67 | 61 | 57 |
| 25 | 18:05 | 69 | 99 | 81 | 58 | 76 | 73 | 67 | 63 | 60 |
| 26 | 18:20 | 70 | 99 | 82 | 56 | 78 | 74 | 67 | 60 | 57 |
| 27 | 18:35 | 70 | 100 | 84 | 56 | 78 | 74 | 68 | 62 | 58 |
| 28 | 18:50 | 70 | 100 | 91 | 57 | 77 | 73 | 68 | 65 | 61 |
| 29 | 19:05 | 71 | 100 | 86 | 60 | 79 | 74 | 69 | 64 | 61 |
| 30 | 19:20 | 69 | 99 | 79 | 55 | 76 | 73 | 68 | 62 | 57 |
| 31 | 19:35 | 71 | 101 | 90 | 58 | 81 | 74 | 68 | 63 | 59 |
| 32 | 19:50 | 69 | 99 | 81 | 55 | 76 | 73 | 67 | 62 | 58 |
| 33 | 20:05 | 71 | 101 | 96 | 55 | 84 | 72 | 65 | 58 | 56 |
| 34 | 20:20 | 70 | 100 | 95 | 54 | 78 | 72 | 66 | 60 | 55 |
| 35 | 20:35 | 67 | 97 | 80 | 52 | 74 | 71 | 65 | 59 | 55 |
| 36 | 20:50 | 67 | 96 | 78 | 53 | 75 | 71 | 64 | 58 | 54 |
| 37 | 21:05 | 66 | 96 | 82 | 52 | 75 | 70 | 63 | 57 | 53 |
| 38 | 21:20 | 67 | 96 | 83 | 52 | 75 | 70 | 63 | 57 | 53 |
| 39 | 21:35 | 66 | 96 | 84 | 51 | 76 | 69 | 63 | 55 | 52 |
| 40 | 21:50 | 66 | 96 | 79 | 51 | 74 | 70 | 64 | 55 | 52 |
| 41 | 22:05 | 65 | 95 | 75 | 52 | 73 | 69 | 63 | 56 | 53 |
| 42 | 22:20 | 68 | 98 | 93 | 51 | 76 | 69 | 62 | 55 | 52 |
| 43 | 22:35 | 65 | 95 | 77 | 50 | 74 | 69 | 62 | 54 | 51 |
| 44 | 22:50 | 65 | 94 | 84 | 51 | 73 | 68 | 62 | 54 | 52 |
| 45 | 23:05 | 66 | 96 | 80 | 52 | 74 | 70 | 64 | 56 | 53 |
| 46 | 23:20 | 67 | 97 | 78 | 53 | 75 | 71 | 64 | 58 | 54 |
| 47 | 23:35 | 68 | 97 | 92 | 52 | 76 | 71 | 65 | 57 | 54 |
| 48 | 23:50 | 67 | 97 | 80 | 52 | 76 | 71 | 64 | 56 | 54 |
| 49 | 00:05 | 66 | 95 | 78 | 51 | 74 | 70 | 63 | 55 | 52 |
| 50 | 00:20 | 66 | 95 | 78 | 51 | 74 | 69 | 63 | 56 | 53 |
| 51 | 00:35 | 66 | 95 | 79 | 52 | 75 | 70 | 62 | 55 | 53 |

| 52 | 00:50 | 66 | 96 | 83 | 51 | 75 | 70 | 63 | 55 | 52 |
|---|---|---|---|---|---|---|---|---|---|---|
| 53 | 01:05 | 66 | 95 | 81 | 50 | 74 | 70 | 62 | 55 | 51 |
| 54 | 01:20 | 64 | 93 | 76 | 49 | 73 | 67 | 60 | 53 | 50 |
| 55 | 01:35 | 63 | 92 | 75 | 48 | 73 | 67 | 59 | 52 | 50 |
| 56 | 01:50 | 65 | 94 | 82 | 47 | 74 | 68 | 59 | 51 | 49 |
| 57 | 02:05 | 64 | 94 | 78 | 47 | 75 | 68 | 59 | 51 | 49 |
| 58 | 02:20 | 64 | 94 | 77 | 47 | 75 | 68 | 57 | 51 | 49 |
| 59 | 02:35 | 61 | 91 | 75 | 48 | 71 | 65 | 56 | 51 | 49 |
| 60 | 02:50 | 69 | 99 | 95 | 49 | 75 | 67 | 57 | 52 | 51 |
| 61 | 03:05 | 63 | 92 | 78 | 47 | 74 | 66 | 56 | 51 | 49 |
| 62 | 03:20 | 62 | 92 | 80 | 46 | 73 | 66 | 56 | 49 | 47 |
| 63 | 03:35 | 59 | 89 | 73 | 47 | 71 | 63 | 53 | 49 | 48 |
| 64 | 03:50 | 60 | 90 | 77 | 47 | 70 | 64 | 55 | 49 | 48 |
| 65 | 04:05 | 61 | 90 | 76 | 47 | 71 | 64 | 55 | 50 | 48 |
| 66 | 04:20 | 63 | 93 | 77 | 49 | 74 | 67 | 58 | 53 | 50 |
| 67 | 04:35 | 63 | 93 | 78 | 51 | 72 | 67 | 58 | 54 | 52 |
| 68 | 04:50 | 64 | 94 | 79 | 48 | 73 | 68 | 58 | 51 | 49 |
| 69 | 05:05 | 62 | 92 | 78 | 48 | 73 | 66 | 56 | 51 | 49 |
| 70 | 05:20 | 62 | 92 | 76 | 47 | 73 | 66 | 55 | 50 | 48 |
| 71 | 05:35 | 63 | 93 | 81 | 48 | 74 | 66 | 56 | 51 | 49 |
| 72 | 05:50 | 62 | 92 | 75 | 48 | 71 | 66 | 58 | 51 | 50 |
| 73 | 06:05 | 62 | 92 | 76 | 47 | 73 | 65 | 57 | 51 | 48 |
| 74 | 06:20 | 64 | 94 | 79 | 48 | 74 | 68 | 59 | 50 | 49 |
| 75 | 06:35 | 64 | 93 | 77 | 49 | 73 | 68 | 60 | 52 | 50 |
| 76 | 06:50 | 63 | 92 | 78 | 47 | 72 | 66 | 59 | 52 | 49 |
| 77 | 07:05 | 65 | 95 | 77 | 50 | 74 | 69 | 62 | 55 | 51 |
| 78 | 07:20 | 67 | 96 | 82 | 51 | 76 | 71 | 63 | 56 | 53 |
| 79 | 07:35 | 68 | 98 | 88 | 51 | 77 | 71 | 64 | 58 | 52 |
| 80 | 07:50 | 72 | 102 | 87 | 52 | 79 | 76 | 71 | 60 | 54 |
| 81 | 08:05 | 70 | 99 | 84 | 55 | 79 | 73 | 67 | 60 | 56 |
| 82 | 08:20 | 69 | 99 | 84 | 53 | 78 | 73 | 66 | 60 | 54 |
| 83 | 08:35 | 70 | 99 | 91 | 55 | 79 | 73 | 67 | 62 | 57 |
| 84 | 08:50 | 69 | 98 | 89 | 55 | 76 | 72 | 66 | 61 | 57 |
| 85 | 09:05 | 69 | 99 | 88 | 54 | 77 | 72 | 67 | 60 | 56 |
| 86 | 09:20 | 69 | 99 | 84 | 56 | 77 | 72 | 67 | 62 | 59 |
| 87 | 09:35 | 70 | 99 | 87 | 57 | 78 | 73 | 67 | 62 | 59 |
| 88 | 09:50 | 69 | 99 | 89 | 56 | 77 | 72 | 66 | 60 | 57 |
| 89 | 10:05 | 70 | 99 | 89 | 55 | 80 | 72 | 67 | 60 | 57 |
| 90 | 10:20 | 68 | 97 | 81 | 55 | 75 | 71 | 66 | 61 | 56 |
| 91 | 10:35 | 69 | 99 | 91 | 56 | 78 | 72 | 66 | 61 | 58 |
| 92 | 10:50 | 74 | 103 | 96 | 59 | 84 | 72 | 66 | 63 | 61 |
| 93 | 11:05 | 70 | 99 | 83 | 55 | 78 | 72 | 67 | 63 | 57 |
| 94 | 11:20 | 68 | 98 | 86 | 54 | 76 | 71 | 66 | 61 | 56 |
| 95 | 11:35 | 69 | 99 | 92 | 57 | 79 | 72 | 66 | 62 | 59 |
| 96 | 11:50 | 69 | 98 | 89 | 59 | 78 | 71 | 65 | 62 | 61 |

RAW NOISE DATA - 4 Tavistock Place, London, WC1 (5th Floor Flat Roof - Rear)

**Client:** Marek Wojciechowski Architects
**Ref:** QF8149/PF5337/RP1
**Date:** 12th to 13th January 2015

| Address | Start Time | LAeq | LE | Lmax | Lmin | LA1 | LA10 | LA50 | LA90 | LA99 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12:16 | 55 | 84 | 85 | 44 | 63 | 53 | 48 | 46 | 46 |
| 2 | 12:31 | 55 | 85 | 81 | 46 | 63 | 58 | 52 | 49 | 47 |
| 3 | 12:46 | 49 | 79 | 64 | 45 | 56 | 51 | 48 | 47 | 46 |
| 4 | 13:01 | 49 | 79 | 59 | 45 | 55 | 51 | 48 | 47 | 46 |
| 5 | 13:16 | 51 | 80 | 66 | 45 | 59 | 54 | 49 | 47 | 46 |
| 6 | 13:31 | 49 | 79 | 64 | 45 | 56 | 51 | 48 | 46 | 46 |
| 7 | 13:46 | 49 | 79 | 60 | 45 | 55 | 51 | 48 | 46 | 46 |
| 8 | 14:01 | 48 | 78 | 62 | 44 | 55 | 50 | 47 | 46 | 45 |
| 9 | 14:16 | 52 | 81 | 68 | 44 | 62 | 53 | 48 | 46 | 45 |
| 10 | 14:31 | 50 | 79 | 69 | 44 | 57 | 52 | 48 | 46 | 45 |
| 11 | 14:46 | 50 | 80 | 72 | 44 | 58 | 53 | 48 | 46 | 45 |
| 12 | 15:01 | 49 | 78 | 62 | 44 | 56 | 51 | 48 | 46 | 45 |
| 13 | 15:16 | 49 | 79 | 64 | 43 | 57 | 52 | 47 | 45 | 44 |
| 14 | 15:31 | 49 | 79 | 67 | 44 | 57 | 51 | 48 | 46 | 45 |
| 15 | 15:46 | 49 | 79 | 70 | 44 | 56 | 51 | 48 | 46 | 45 |
| 16 | 16:01 | 50 | 80 | 62 | 45 | 58 | 52 | 48 | 46 | 46 |
| 17 | 16:16 | 52 | 81 | 65 | 45 | 61 | 54 | 50 | 47 | 46 |
| 18 | 16:31 | 51 | 80 | 66 | 45 | 59 | 53 | 49 | 47 | 46 |
| 19 | 16:46 | 51 | 81 | 71 | 46 | 59 | 53 | 50 | 48 | 47 |
| 20 | 17:01 | 55 | 84 | 74 | 46 | 68 | 54 | 50 | 48 | 47 |
| 21 | 17:16 | 51 | 80 | 69 | 45 | 57 | 53 | 49 | 47 | 46 |
| 22 | 17:31 | 57 | 86 | 77 | 45 | 71 | 54 | 50 | 48 | 47 |
| 23 | 17:46 | 50 | 79 | 63 | 44 | 57 | 52 | 49 | 47 | 45 |
| 24 | 18:01 | 51 | 80 | 63 | 45 | 57 | 53 | 49 | 47 | 46 |
| 25 | 18:16 | 51 | 81 | 62 | 46 | 57 | 54 | 50 | 48 | 47 |
| 26 | 18:31 | 51 | 80 | 67 | 45 | 58 | 53 | 49 | 48 | 46 |
| 27 | 18:46 | 51 | 81 | 67 | 45 | 58 | 54 | 50 | 48 | 47 |
| 28 | 19:01 | 57 | 86 | 77 | 45 | 70 | 56 | 50 | 48 | 46 |
| 29 | 19:16 | 51 | 81 | 66 | 46 | 57 | 53 | 50 | 49 | 48 |
| 30 | 19:31 | 52 | 81 | 66 | 46 | 60 | 54 | 50 | 48 | 47 |
| 31 | 19:46 | 50 | 80 | 62 | 44 | 57 | 52 | 49 | 47 | 45 |
| 32 | 20:01 | 51 | 81 | 70 | 44 | 60 | 52 | 49 | 46 | 45 |
| 33 | 20:16 | 48 | 78 | 62 | 43 | 56 | 50 | 47 | 45 | 44 |
| 34 | 20:31 | 50 | 80 | 73 | 43 | 59 | 52 | 47 | 45 | 44 |
| 35 | 20:46 | 47 | 77 | 58 | 42 | 55 | 50 | 46 | 45 | 43 |
| 36 | 21:01 | 48 | 77 | 68 | 43 | 55 | 50 | 46 | 44 | 43 |
| 37 | 21:16 | 47 | 76 | 58 | 42 | 53 | 49 | 46 | 44 | 43 |
| 38 | 21:31 | 46 | 76 | 60 | 41 | 54 | 48 | 45 | 43 | 42 |
| 39 | 21:46 | 46 | 76 | 58 | 41 | 53 | 48 | 45 | 43 | 42 |
| 40 | 22:01 | 46 | 76 | 58 | 41 | 52 | 48 | 45 | 43 | 42 |
| 41 | 22:16 | 47 | 77 | 66 | 42 | 57 | 49 | 45 | 43 | 42 |
| 42 | 22:31 | 45 | 75 | 54 | 42 | 50 | 47 | 45 | 43 | 42 |
| 43 | 22:46 | 47 | 76 | 61 | 42 | 55 | 49 | 45 | 43 | 42 |
| 44 | 23:01 | 47 | 77 | 60 | 43 | 53 | 49 | 46 | 45 | 44 |
| 45 | 23:16 | 51 | 80 | 65 | 46 | 56 | 52 | 50 | 49 | 47 |
| 46 | 23:31 | 51 | 80 | 62 | 47 | 56 | 52 | 50 | 49 | 48 |
| 47 | 23:46 | 50 | 80 | 62 | 46 | 55 | 52 | 49 | 48 | 47 |
| 48 | 00:01 | 49 | 79 | 62 | 46 | 54 | 51 | 49 | 48 | 47 |
| 49 | 00:16 | 50 | 80 | 61 | 45 | 55 | 52 | 50 | 47 | 46 |

| 50 | 00:31 | 48 | 78 | 60 | 44 | 53 | 50 | 47 | 46 | 45 |
|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 00:46 | 48 | 78 | 62 | 44 | 55 | 50 | 47 | 46 | 45 |
| 52 | 01:01 | 47 | 77 | 60 | 43 | 54 | 49 | 46 | 44 | 43 |
| 53 | 01:16 | 46 | 75 | 60 | 42 | 52 | 48 | 45 | 44 | 43 |
| 54 | 01:31 | 47 | 77 | 58 | 43 | 52 | 48 | 47 | 45 | 44 |
| 55 | 01:46 | 46 | 76 | 63 | 42 | 53 | 48 | 45 | 44 | 43 |
| 56 | 02:01 | 46 | 76 | 63 | 42 | 52 | 48 | 45 | 44 | 43 |
| 57 | 02:16 | 45 | 75 | 59 | 42 | 51 | 47 | 45 | 43 | 43 |
| 58 | 02:31 | 47 | 76 | 59 | 43 | 52 | 49 | 46 | 45 | 44 |
| 59 | 02:46 | 52 | 81 | 70 | 46 | 57 | 53 | 50 | 47 | 47 |
| 60 | 03:01 | 48 | 78 | 65 | 43 | 54 | 50 | 48 | 46 | 45 |
| 61 | 03:16 | 45 | 75 | 57 | 41 | 50 | 47 | 45 | 43 | 42 |
| 62 | 03:31 | 44 | 73 | 60 | 40 | 50 | 45 | 43 | 42 | 41 |
| 63 | 03:46 | 43 | 72 | 56 | 40 | 48 | 44 | 42 | 41 | 41 |
| 64 | 04:01 | 45 | 74 | 60 | 40 | 52 | 48 | 43 | 41 | 41 |
| 65 | 04:16 | 53 | 82 | 65 | 44 | 57 | 55 | 53 | 47 | 45 |
| 66 | 04:31 | 55 | 85 | 63 | 49 | 60 | 58 | 54 | 52 | 51 |
| 67 | 04:46 | 51 | 81 | 61 | 43 | 57 | 55 | 49 | 46 | 44 |
| 68 | 05:01 | 51 | 80 | 63 | 43 | 59 | 53 | 47 | 45 | 44 |
| 69 | 05:16 | 45 | 75 | 63 | 41 | 50 | 47 | 45 | 43 | 42 |
| 70 | 05:31 | 45 | 74 | 58 | 40 | 50 | 46 | 44 | 42 | 41 |
| 71 | 05:46 | 44 | 74 | 57 | 40 | 51 | 46 | 43 | 42 | 41 |
| 72 | 06:01 | 45 | 74 | 69 | 40 | 50 | 46 | 43 | 42 | 41 |
| 73 | 06:16 | 45 | 74 | 55 | 40 | 51 | 47 | 44 | 42 | 41 |
| 74 | 06:31 | 44 | 74 | 55 | 40 | 51 | 47 | 43 | 42 | 41 |
| 75 | 06:46 | 45 | 75 | 56 | 40 | 52 | 47 | 44 | 42 | 42 |
| 76 | 07:01 | 46 | 75 | 58 | 42 | 52 | 48 | 45 | 43 | 42 |
| 77 | 07:16 | 47 | 77 | 60 | 42 | 53 | 50 | 46 | 44 | 43 |
| 78 | 07:31 | 48 | 77 | 64 | 42 | 57 | 49 | 46 | 44 | 43 |
| 79 | 07:46 | 49 | 79 | 65 | 42 | 58 | 52 | 47 | 44 | 43 |
| 80 | 08:01 | 50 | 79 | 61 | 44 | 57 | 52 | 49 | 46 | 45 |
| 81 | 08:16 | 49 | 79 | 62 | 43 | 57 | 51 | 48 | 45 | 44 |
| 82 | 08:31 | 50 | 79 | 65 | 42 | 58 | 53 | 48 | 45 | 43 |
| 83 | 08:46 | 49 | 79 | 61 | 43 | 56 | 52 | 48 | 45 | 44 |
| 84 | 09:01 | 51 | 81 | 78 | 42 | 57 | 53 | 48 | 45 | 44 |
| 85 | 09:16 | 52 | 81 | 67 | 44 | 61 | 55 | 49 | 46 | 45 |
| 86 | 09:31 | 57 | 86 | 75 | 44 | 71 | 56 | 52 | 47 | 45 |
| 87 | 09:46 | 55 | 84 | 70 | 45 | 64 | 57 | 51 | 48 | 46 |
| 88 | 10:01 | 54 | 83 | 80 | 44 | 62 | 56 | 51 | 47 | 46 |
| 89 | 10:16 | 51 | 81 | 70 | 43 | 59 | 55 | 49 | 46 | 45 |
| 90 | 10:31 | 50 | 79 | 68 | 43 | 58 | 52 | 48 | 46 | 44 |
| 91 | 10:46 | 50 | 80 | 68 | 43 | 59 | 52 | 48 | 45 | 44 |
| 92 | 11:01 | 52 | 82 | 68 | 43 | 63 | 54 | 49 | 46 | 44 |
| 93 | 11:16 | 48 | 78 | 62 | 42 | 56 | 51 | 47 | 45 | 44 |
| 94 | 11:31 | 50 | 79 | 69 | 43 | 58 | 53 | 48 | 45 | 44 |
| 95 | 11:46 | 50 | 80 | 64 | 43 | 59 | 54 | 48 | 46 | 44 |
| 96 | 12:01 | 50 | 79 | 70 | 43 | 57 | 52 | 47 | 45 | 44 |

# APPENDIX 'B'

Photos and sketches

N°2 Tavistock Place

N°4 Tavistock Place

N°6 Tavistock Place

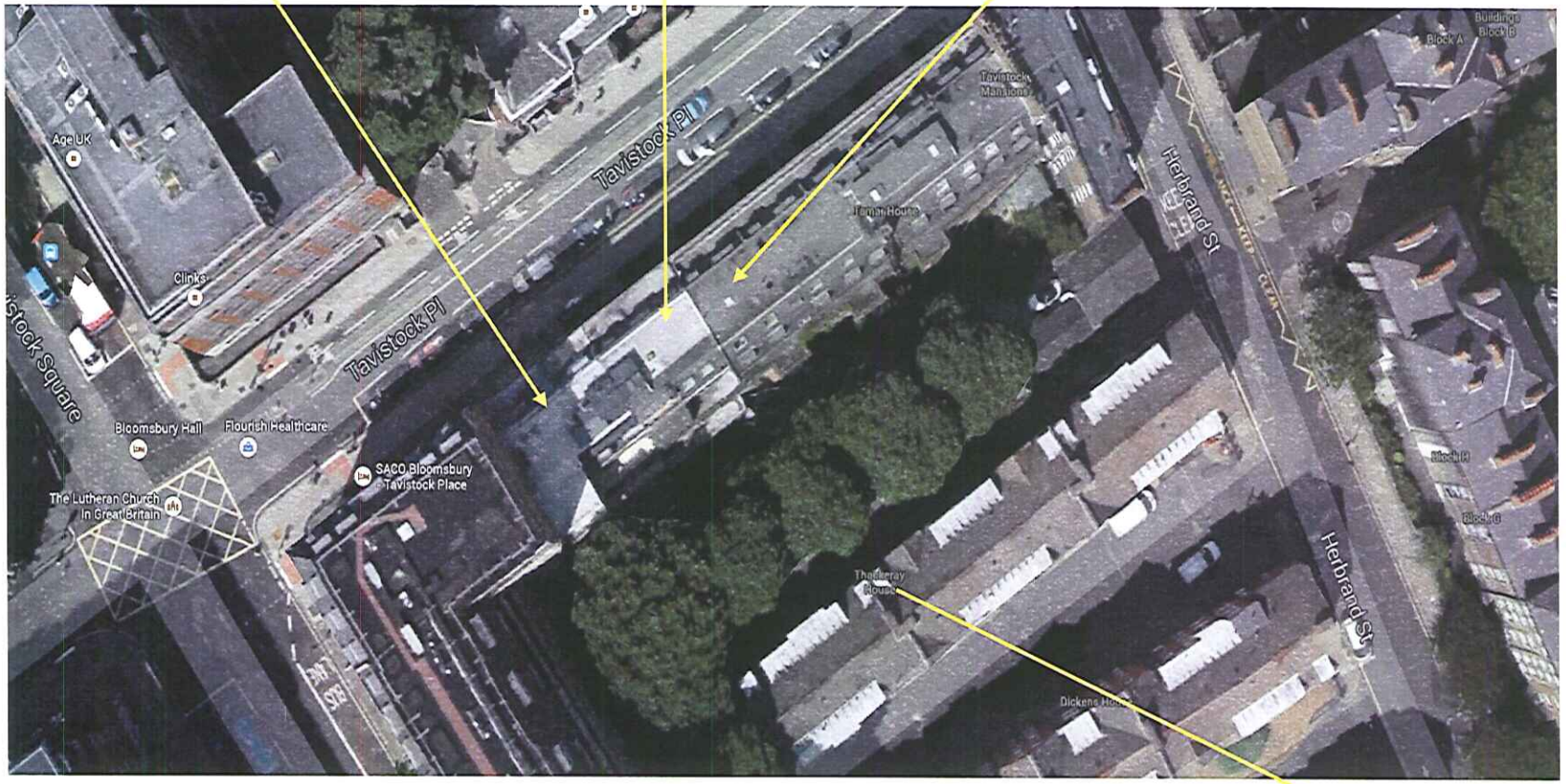


Photo 'A' - showing location of N°4 Tavistock Place, London WC1

Thackeray House

Microphone location

Photo 'B' - showing location of microphone at the front of N$^{O}$4 Tavistock Place

Microphone location

Photo 'C' - showing location of microphone at the rear of N°4 Tavistock Place