CONABEARE ACOUSTICS



# ACOUSTIC REPORT

## Ref. No. CS 7076

**71 Kingsway**
**London**
**WC2**

**15th August 2011**

**Prepared By:**

.....

**John E Redknap** MBA, MIOA, MCMI

**Checked By:**

.....

**David Whymark - Director**

**Client:** **Callisia Limited**
**443 Stroude Road**
**Virginia Water**
**Surrey**
**GU25 4BU**

**Conabeare Acoustics Limited**
10 Chiltern Enterprise Centre, Station Road, Theale, Berkshire. RG7 4AA
Telephone 0118 930 3650 Facsimile 0118 930 3912
sales@conabeare.co.uk

## FORWARD

New air conditioning equipment is proposed on the roof of the premises, adjacent to existing units. Conabeare Acoustics Limited has therefore been commissioned to undertake an Environmental Sound Survey at this level of the building.

The results of the survey will establish the Background Sound Level to enable checks to be made on the mechanical services plant in order that they comply with planning requirements.

## SUMMARY

The lowest measured Background Sound Levels $L_{A90.15MIN}$ were as follows:

| | |
|---|---|
| $L_{A90.15MIN}$ | 54.6dB(A) between 07:00 hours to 19:00 hours (Day Time) |
| $L_{A90.15MIN}$ | 45.6dB(A) between 19:00 hours to 23:00 hours (Evening) |
| $L_{A90.15MIN}$ | 40.3dB(A) between 23:00 hours to 07:00 hours (Night Time) |


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## 1. Author

John E Redknap MBA, MIOA, MCMI

The author has been practising in noise control engineering since 1985. He has gained a wide range of experience over this period and is employed as a Sales Engineer for **Conabeare Acoustics Ltd.**

## 2. Client

The survey and report has been undertaken on behalf of:

**Callisia Limited**
**443 Stroude Road**
**Virginia Water**
**Surrey**
**GU25 4BU**

## 3. Introduction

New air conditioning equipment is proposed on the roof of the premises, adjacent to existing units. Conabeare Acoustics Limited has therefore been commissioned to undertake an Environmental Sound Survey at this level of the building.

An Environmental Sound Survey has been carried out to establish the existing Background Sound Levels. The results of the Environmental Sound Survey are also used as a datum so that acoustic calculations can be undertaken to determine the likely impact of the proposed plant on the nearest sound sensitive locations.

## 4. Noise Principles

The Environmental Sound Survey has been carried out in accordance with the principles of BS7445-1 (2003) to establish the existing Background Sound Levels. The Background Sound Level measured is in terms of A-weighted sound pressure level $L_{A90}$ with a time interval of 15 minutes.


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## 5. The Site

The property is located at 71 Kingsway, London WC2, an area dominated by commercial/office buildings. The proposed air conditioning equipment is to be located at roof level, adjacent to the existing plant. It was noted whilst on site that there is also other existing plant on this roof as well a considerable amount of plant on the surrounding roof areas. The general ambient noise level in the area is therefore expected to be dominated by existing plant noise, plus traffic noise from the busy Kingsway.

## 6. Measurement Methodology

A SVAN 949 (Precision) Environmental Sound Level Analyser, fitted with an Electret Microphone was secured to the existing railings on the roof of the property, positioned as illustrated on the attached location photograph.

The survey was carried out from 08:59 hours on Tuesday 9th August 2011, up until 09:29 hours on Wednesday 10th August 2011.

The Analyser was programmed to produce the following indices:

$L_{AEQ.15MIN}$, $L_{A90.15MIN}$, $L_{A10.15MIN}$

Attached for your reference is a Glossary of these terms.

The analyser was checked for calibration before the survey commenced and at the end of survey with a CEL 284/2 Class 1 calibrator with no measurable deviation.

The weather was generally dry and warm, with partly cloudy skies.

Having reviewed the results of our survey, it is our opinion that the weather experienced over the survey period has not had any detrimental effect on the lowest recorded readings and therefore on our recommendations.

## 7. Planning Noise Requirements

The Planning noise requirement for this area will be assessed against the criteria set out in the Council's Unitary Development Plan (UDP). As a guide, the predicted level from any proposed plant should be at least 10dB(A) below the lowest measured Background Sound Level ($L_{A90}$) at 1 metre from the nearest effected residential property. Allowance should also be made for any tonal noise emanating from the proposed units.


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## 8. Assessment

The objective of any specification limiting sound should be to ensure that sound emissions from the proposed plant should not materially add to the existing ambient noise climate when measured 1m from the nearest effected property window.

The level at which the target should be set is normally specified by the planning authority in their planning consent conditions.

In the absence of any such specification, we would recommend setting a limit on the proposed plant sound level as follows, with the proviso that any sound produced by this plant must be quite free of any audibly evident, tonality or similar characteristics.

The lowest measured Background Sound Levels $L_{A90,15min}$ were as follows:

$L_{A90,15MIN}$ 54.6dB(A) between 07:00 hours to 19:00 hours (Day Time)
$L_{A90,15MIN}$ 45.6dB(A) between 19:00 hours to 23:00 hours (Evening)
$L_{A90,15MIN}$ 40.3dB(A) between 23:00 hours to 07:00 hours (Night Time)

**Residential Accommodation**
The current design policy of council planners is that noise produced by mechanical plant should be at least 10dB(A) below the background sound level at the nearest sound sensitive window.

It should also be noted that this should be achieved with all plant operating normally, any plant exhibiting characteristics which are tonal or intermittent in nature should be designed to criteria 5dB(A) more stringent. Allowances should also be made for the additional effect of multiple noise sources.

The above is generally acceptable to local authority for this area but this should be as a matter of course be verified with the local Environmental Health or Planning Departments.

**Office Accommodation**
Standing on the roof of the premises, there appeared to be no residential properties in the immediate vicinity.

At the rear of the property, across a lightwell, is the Kensington College of Business building, with the top floor virtually level with the roof of 71 Kingsway.

Further along Kingsway, across Wild Court, the upper floors of the building adjacent to number 71 Kingsway contains office accommodation.


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For the purposes of this report, we have assumed these two locations to be the closest office accommodation and thereby the nearest sound sensitive windows.

The Kensington College of Business windows are estimated to be at distance of 5m from the centre of the proposed plant. This position is referenced as Assessment Location A in our acoustic calculations and on our location photograph.

The adjacent office windows are estimated to be at distance of 15m from the centre of the proposed plant. This position is referenced as Assessment Location B in our acoustic calculations and on our location photograph.

As we are not considering residential properties in this report, in our opinion it is appropriate to consider higher noise limits than those previously suggested for Residential Accommodation.

**Proposed Design Target**

BS8233: 1999 Sound insulation and noise reduction for buildings – Code of practice, recommends that noise levels in offices should be 40 to 45dB LAeq,T. In order to determine an appropriate noise criterion outside such offices it is necessary to consider the minimum sound reduction that may be provided by the external building fabric of such offices.

In the worst case it may be considered that some of the windows of these buildings may be openable. It is known that open windows provide a sound reduction of 10 – 15dBA. It is reasonable, therefore, to set a noise criterion of 50 to 55 dB LAeq,T at 1m from the façades of such buildings.

In our opinion the above would generally be acceptable to the local authority for this area, but all design targets should as a matter of course should be verified with the local Environmental Health or Planning Departments.

For Assessment Location A, we have illustrated on the attached calculation sheet that at 1 metre from the façade the Specific Sound Level would be 46dB(A). This figure is clearly below our limits of our suggested design target of 50 to 55 dB LAeq,T for Office Accommodation and should therefore meet the planning requirements of the local authority.

For Assessment Location B, we have illustrated on the attached calculation sheet that at 1 metre from the façade the Specific Sound Level would be 37dB(A). This figure is clearly below our limits of our suggested design target of 50 to 55 dB LAeq,T for Office Accommodation and should therefore meet the planning requirements of the local authority.


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The proposed plant for this project is 3no. Mitsubishi SRK50ZJ-S and 2no. SRK63ZK-S as positioned on the Callisia drawing Q11115/M/03 revison A. We are advised that only single figure data is available for the proposed plant. Consequently, for the purposes of this report, and to enable spectrum analysis of the plant to be undertaken, we have been given sound data of a similar unit and asked to utilize this data in our calculations. It should therefore be noted that in both calculation sheets we have used the sound pressure spectrum data for a Mitsubishi PKA-RP100KAL.

## 9. Sound Level Measurements

The statistical readings obtained during the survey are attached to this report and are presented in both graphical and tabular form.

## 10. Glossary of Terms

| | |
|---|---|
| $L_{A90}$ | The sound pressure level in dB(A) which is exceeded for 90% of the time and is taken to be the effective lowest background sound level for the period by such methods of sound rating as that recommended in British Standard 4142. It will also be used as a basis for selecting limiting sound levels from new plant by Local Planning Authorities when setting Planning Consent Conditions. |
| $L_{eq}$ | The "equivalent continuous sound level" for the measuring period, defined as the level in dB(A) which, if held constant over the measuring period, would produce the same amount of sound energy as does the actual varying ambient sound level. It is a measure of the amount of sound energy affecting the site from sources other than new plant or operations. |
| $L_{A10}$ | The sound level exceeded for 10% of the time over the sample period. Originally used as a measure of subjective reaction to traffic noise in particular, it can also be taken as an indication of the practical maximum sound level that the building envelope will have to protect against. |
| dB(A) | Describes measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to halving or doubling the loudness of a sound. |


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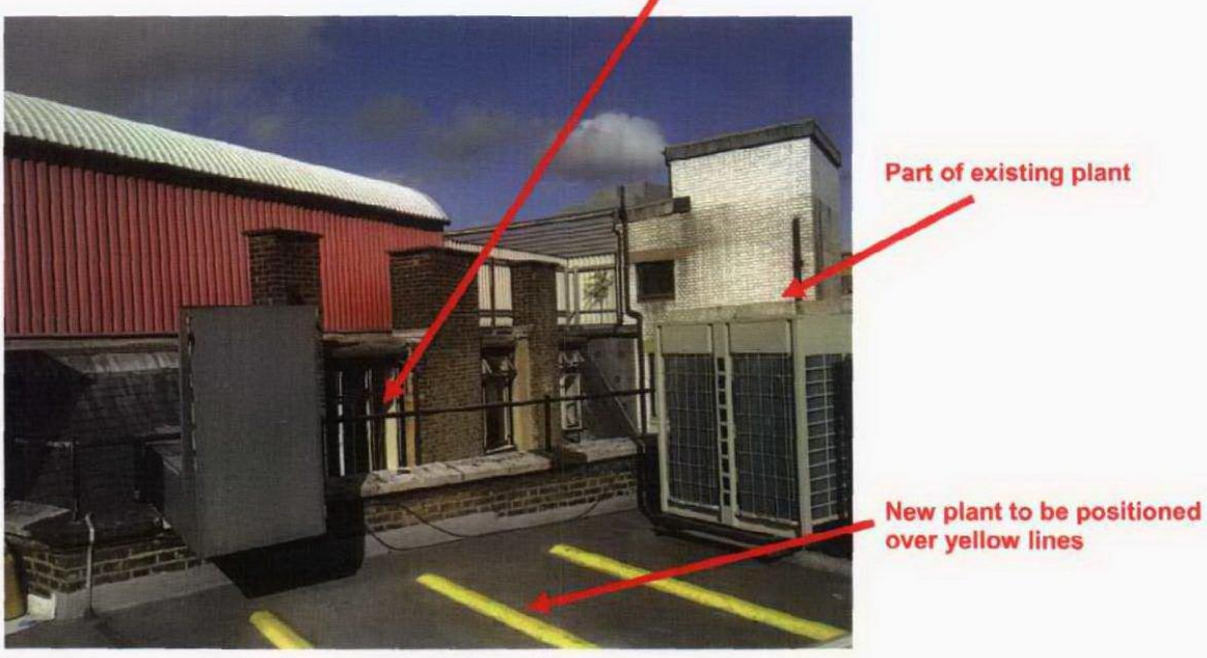
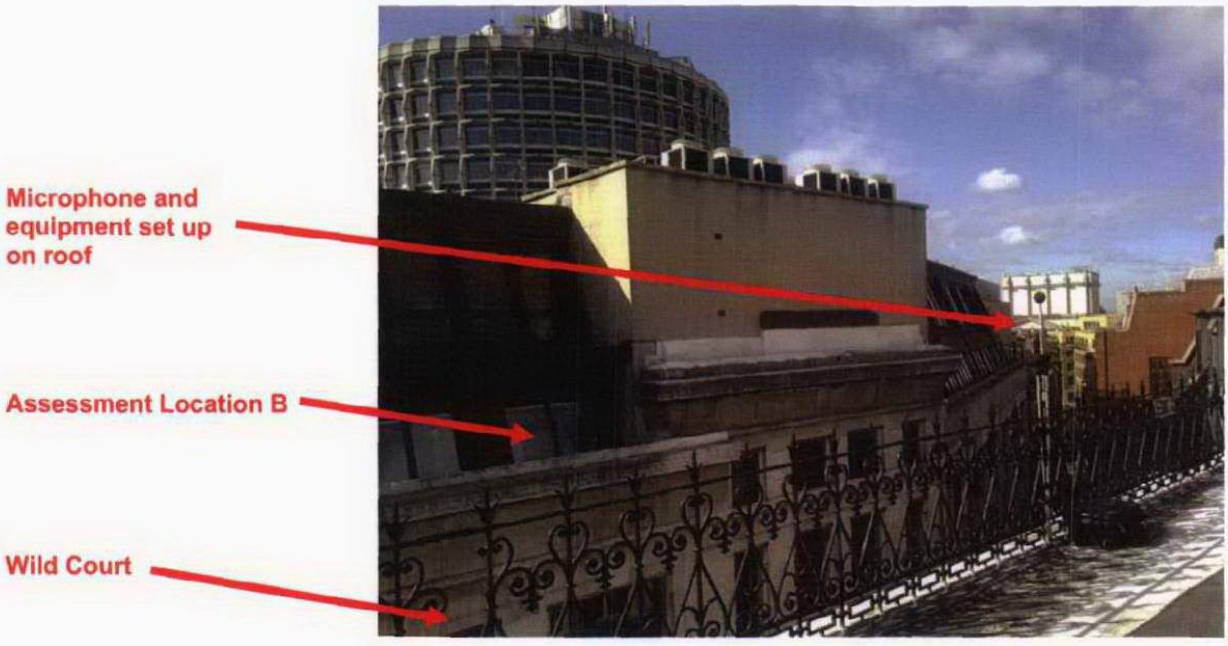
## 11. Location Photographs





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## CONABEARE ACOUSTICS LTD CALCULATION SHEET - One

| CLIENT: **Callisia** | | PROJECT: **71 Kingsway** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | DATE: **15th August 2011** | | | | | | | |
| **Roof Top Plant Location** | | Conabeare Acoustics ref: **CS7076** | | | | | | | |
| | | Octave Band Centre Frequency (Hz) | | | | | | | |
| **Description** | | **63** | **125** | **250** | **500** | **1K** | **2K** | **4K** | **8K** | **dB(A)** |
| **LOCATION 'A' ASSESSMENT** | | | | | | | | | | |
| Mitsubishi PKA-RP100KAL | Lp @ 1m | **45** | **45** | **48** | **44** | **45** | **43** | **36** | **27** | **49** |
| Additional units | Four | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| Combined Total | | **51** | **51** | **54** | **50** | **51** | **49** | **42** | **33** | **55** |
| Additional Surface Reflections | None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Screening via building | None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Additional Distance 1to 5m to nearest window | | -12 | -12 | -12 | -12 | -12 | -12 | -12 | -12 | |
| Façade Correction | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| **Lp @1m from receivers façade** | | **42** | **42** | **45** | **41** | **42** | **40** | **33** | **24** | **46** |

**Notes**

**Calculations are to the nearest top floor windows of the adjacent Kensington Business College**
**No allowance has been made for any noise/vibration transfer through floor/structure**
**Vibration isolation will be required for the new plant**

## CONABEARE ACOUSTICS LTD CALCULATION SHEET - Two

| CLIENT: **Callisia** | | PROJECT: **71 Kingsway** | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | DATE: **15th August 2011** | | | | | | | |
| **Roof Top Plant Location** | | Conabeare Acoustics ref: **CS7076** | | | | | | | |
| | | Octave Band Centre Frequency (Hz) | | | | | | | |
| **Description** | | **63** | **125** | **250** | **500** | **1K** | **2K** | **4K** | **8K** | **dB(A)** |
| **LOCATION 'B' ASSESSMENT** | | | | | | | | | | |
| Mitsubishi PKA-RP100KAL | Lp @ 1m | **45** | **45** | **48** | **44** | **45** | **43** | **36** | **27** | **49** |
| Additional units | Four | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| Combined Total | | **51** | **51** | **54** | **50** | **51** | **49** | **42** | **33** | **55** |
| Additional Surface Reflections | None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Screening via building | None | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Additional Distance 1to 15m to nearest window | | -21 | -21 | -21 | -21 | -21 | -21 | -21 | -21 | |
| Façade Correction | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| **Lp @1m from receivers façade** | | **33** | **33** | **36** | **32** | **33** | **31** | **24** | **15** | **37** |

**Notes**

**Calculations are to the nearest top floor windows of the adjacent office building**

**No allowance has been made for any noise/vibration transfer through floor/structure**

**Vibration isolation will be required for the new plant**

| Header information for the file[1] @CAL323( |
|---|
| Device type ..... SVAN 949 |
| Serial No. ..... 8572 |
| Internal software version ... 5.13 |
| File system version ..... 5.12 |
| Original file name ..... @CAL3230 |
| Measurement hour ..... 08:59'50 |
| Measurement day ..... 09/08/11 |
| Device function ..... OCTAVE 1/1 |
| Title text: |
| Input ..... Microphone |
| Mic. polarization ..... 0 V |
| Mic. field correction ..... FREE |
| Mic. outdoor filter ..... OFF |
| Compensation filter ..... OFF |
| Measurement range ..... 105 dB |
| Leq integration ..... Linear |
| Trig. mode ..... OFF |
| Start delay ..... 1 s |
| Integration time def. ..... 15 m |
| Repetition cycle ..... Infinity |
| Number of spectra ..... 1 |
| Octave 1/1 lines ..... 15+3 |
| Octave 1/1 filter ..... Lin |
| Octave 1/1 in buffer ..... OFF |
| Number of histograms ..... 3+18 |
| Calibration type ..... Measuremer |
| Calibration time ..... 08:52'12 |
| Calibration date ..... 09/08/11 |
| Rotation measurement ..... OFF |
| Profile: #1 |
| Weighting filter ..... A |
| Detector type ..... Fast |
| Buffer contents definition .. None |
| Calibration factor ..... 2.5 dB |

Main_results:

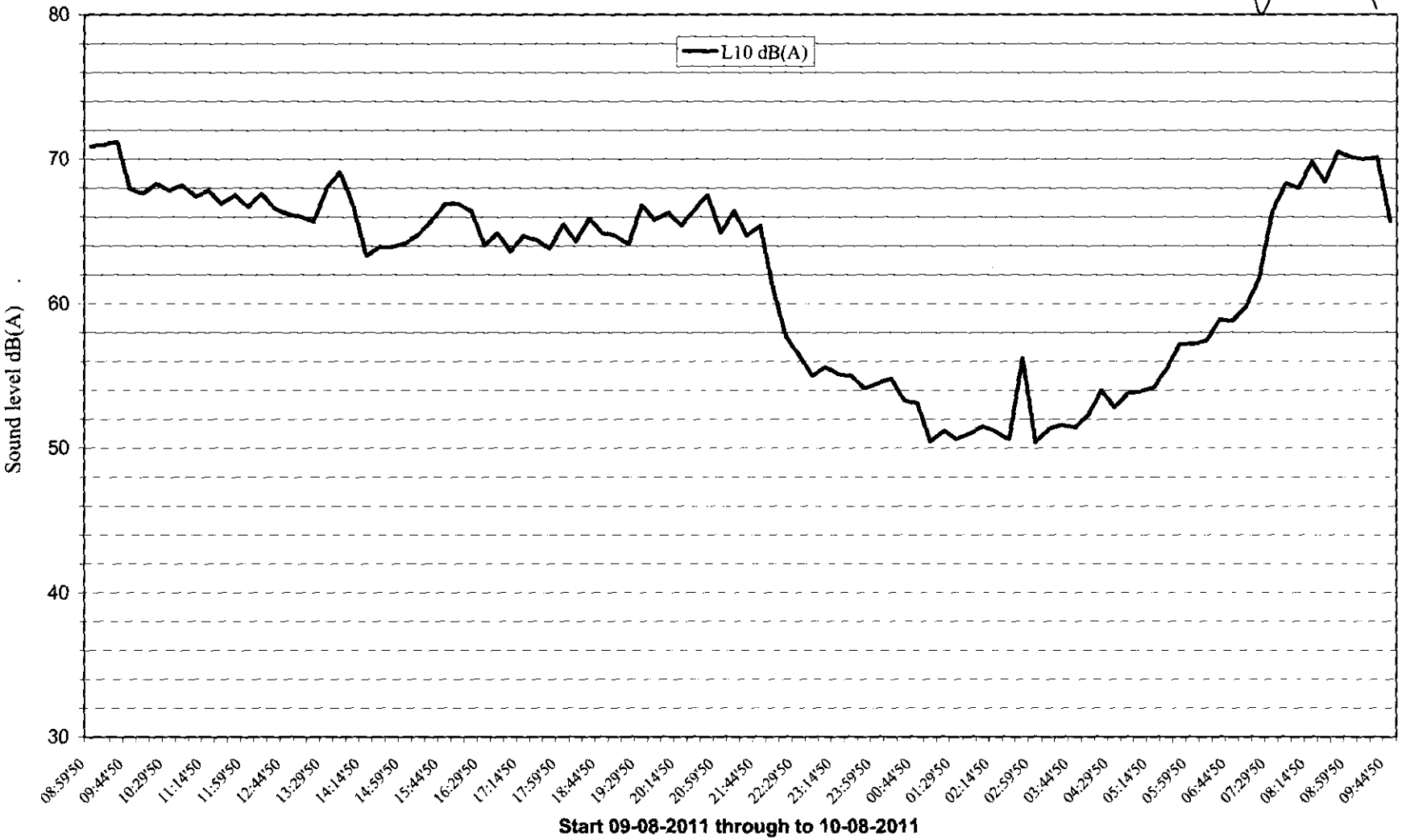
| File | Date | Start | Filter | Detect | Time | units | Leq (A) | L1 dB(A) | L10 dB(A) | L90 dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| @CAL3230 | 09/08/11 | 08:59'50 | A | Fast | 00:15'00 | dB | 68.7 | 77.6 | 70.9 | 63.1 |
| @CAL3231 | 09/08/11 | 09:14'50 | A | Fast | 00:15'00 | dB | 68.0 | 75.2 | 71.0 | 63.4 |
| @CAL3232 | 09/08/11 | 09:29'50 | A | Fast | 00:15'00 | dB | 67.9 | 74.9 | 71.2 | 63.2 |
| @CAL3233 | 09/08/11 | 09:44'50 | A | Fast | 00:15'00 | dB | 65.7 | 71.7 | 67.9 | 62.2 |
| @CAL3234 | 09/08/11 | 09:59'50 | A | Fast | 00:15'00 | dB | 65.3 | 70.7 | 67.6 | 61.4 |
| @CAL3235 | 09/08/11 | 10:14'50 | A | Fast | 00:15'00 | dB | 65.7 | 72.3 | 68.3 | 61.4 |
| @CAL3236 | 09/08/11 | 10:29'50 | A | Fast | 00:15'00 | dB | 66.0 | 73.2 | 67.8 | 61.6 |
| @CAL3237 | 09/08/11 | 10:44'50 | A | Fast | 00:15'00 | dB | 66.0 | 72.9 | 68.2 | 62.0 |
| @CAL3238 | 09/08/11 | 10:59'50 | A | Fast | 00:15'00 | dB | 65.2 | 73.6 | 67.4 | 60.5 |
| @CAL3239 | 09/08/11 | 11:14'50 | A | Fast | 00:15'00 | dB | 68.1 | 80.1 | 67.8 | 60.2 |
| @CAL3240 | 09/08/11 | 11:29'50 | A | Fast | 00:15'00 | dB | 67.4 | 77.0 | 66.9 | 61.2 |
| @CAL3241 | 09/08/11 | 11:44'50 | A | Fast | 00:15'00 | dB | 68.5 | 80.7 | 67.5 | 61.2 |
| @CAL3242 | 09/08/11 | 11:59'50 | A | Fast | 00:15'00 | dB | 64.9 | 72.2 | 66.7 | 60.7 |
| @CAL3243 | 09/08/11 | 12:14'50 | A | Fast | 00:15'00 | dB | 65.7 | 73.4 | 67.6 | 61.7 |
| @CAL3244 | 09/08/11 | 12:29'50 | A | Fast | 00:15'00 | dB | 65.2 | 73.4 | 66.6 | 60.1 |
| @CAL3245 | 09/08/11 | 12:44'50 | A | Fast | 00:15'00 | dB | 63.9 | 69.9 | 66.2 | 60.5 |
| @CAL3246 | 09/08/11 | 12:59'50 | A | Fast | 00:15'00 | dB | 64.4 | 73.7 | 66.0 | 59.4 |
| @CAL3247 | 09/08/11 | 13:14'50 | A | Fast | 00:15'00 | dB | 63.8 | 71.0 | 65.7 | 59.1 |
| @CAL3248 | 09/08/11 | 13:29'50 | A | Fast | 00:15'00 | dB | 65.5 | 73.8 | 68.0 | 59.1 |
| @CAL3249 | 09/08/11 | 13:44'50 | A | Fast | 00:15'00 | dB | 65.6 | 73.6 | 69.1 | 59.9 |
| @CAL3250 | 09/08/11 | 13:59'50 | A | Fast | 00:15'00 | dB | 65.4 | 73.9 | 66.8 | 59.1 |
| @CAL3251 | 09/08/11 | 14:14'50 | A | Fast | 00:15'00 | dB | 61.1 | 69.5 | 63.3 | 56.3 |
| @CAL3252 | 09/08/11 | 14:29'50 | A | Fast | 00:15'00 | dB | 67.3 | 80.7 | 63.9 | 56.0 |
| @CAL3253 | 09/08/11 | 14:44'50 | A | Fast | 00:15'00 | dB | 61.8 | 69.4 | 63.9 | 56.6 |
| @CAL3254 | 09/08/11 | 14:59'50 | A | Fast | 00:15'00 | dB | 65.7 | 79.6 | 64.2 | 56.9 |
| @CAL3255 | 09/08/11 | 15:14'50 | A | Fast | 00:15'00 | dB | 62.6 | 72.1 | 64.8 | 56.8 |
| @CAL3256 | 09/08/11 | 15:29'50 | A | Fast | 00:15'00 | dB | 65.1 | 75.9 | 65.8 | 57.4 |
| @CAL3257 | 09/08/11 | 15:44'50 | A | Fast | 00:15'00 | dB | 67.8 | 80.9 | 66.9 | 57.7 |

Main_results:

| File | Date | Start | Filter | Detect | Time | units | Leq (A) | L1 dB(A) | L10 dB(A) | L90 dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|
| @CAL3258 | 09/08/11 | 15:59'50 | A | Fast | 00:15'00 | dB | 67.1 | 79.4 | 66.9 | 60.8 |
| @CAL3259 | 09/08/11 | 16:14'50 | A | Fast | 00:15'00 | dB | 67.8 | 80.0 | 66.4 | 58.4 |
| @CAL3260 | 09/08/11 | 16:29'50 | A | Fast | 00:15'00 | dB | 67.5 | 78.3 | 64.0 | 57.4 |
| @CAL3261 | 09/08/11 | 16:44'50 | A | Fast | 00:15'00 | dB | 66.0 | 78.3 | 64.9 | 57.0 |
| @CAL3262 | 09/08/11 | 16:59'50 | A | Fast | 00:15'00 | dB | 61.2 | 67.8 | 63.6 | 56.7 |
| @CAL3263 | 09/08/11 | 17:14'50 | A | Fast | 00:15'00 | dB | 64.7 | 72.5 | 64.7 | 57.3 |
| @CAL3264 | 09/08/11 | 17:29'50 | A | Fast | 00:15'00 | dB | 61.9 | 69.7 | 64.4 | 57.8 |
| @CAL3265 | 09/08/11 | 17:44'50 | A | Fast | 00:15'00 | dB | 61.7 | 69.4 | 63.8 | 56.5 |
| @CAL3266 | 09/08/11 | 17:59'50 | A | Fast | 00:15'00 | dB | 62.6 | 69.5 | 65.5 | 57.8 |
| @CAL3267 | 09/08/11 | 18:14'50 | A | Fast | 00:15'00 | dB | 61.8 | 69.1 | 64.3 | 57.3 |
| @CAL3268 | 09/08/11 | 18:29'50 | A | Fast | 00:15'00 | dB | 65.9 | 76.9 | 65.9 | 57.9 |
| @CAL3269 | 09/08/11 | 18:44'50 | A | Fast | 00:15'00 | dB | 62.6 | 70.1 | 64.9 | 57.9 |
| @CAL3270 | 09/08/11 | 18:59'50 | A | Fast | 00:15'00 | dB | 62.1 | 67.9 | 64.7 | 57.7 |
| @CAL3271 | 09/08/11 | 19:14'50 | A | Fast | 00:15'00 | dB | 61.3 | 67.7 | 64.1 | 55.9 |
| @CAL3272 | 09/08/11 | 19:29'50 | A | Fast | 00:15'00 | dB | 67.0 | 80.0 | 66.8 | 58.0 |
| @CAL3273 | 09/08/11 | 19:44'50 | A | Fast | 00:15'00 | dB | 62.9 | 70.2 | 65.8 | 57.1 |
| @CAL3274 | 09/08/11 | 19:59'50 | A | Fast | 00:15'00 | dB | 63.6 | 70.7 | 66.3 | 58.8 |
| @CAL3275 | 09/08/11 | 20:14'50 | A | Fast | 00:15'00 | dB | 62.8 | 68.5 | 65.4 | 58.4 |
| @CAL3276 | 09/08/11 | 20:29'50 | A | Fast | 00:15'00 | dB | 63.8 | 72.2 | 66.5 | 57.4 |
| @CAL3277 | 09/08/11 | 20:44'50 | A | Fast | 00:15'00 | dB | 64.8 | 75.0 | 67.5 | 58.3 |
| @CAL3278 | 09/08/11 | 20:59'50 | A | Fast | 00:15'00 | dB | 62.0 | 68.4 | 64.9 | 56.9 |
| @CAL3279 | 09/08/11 | 21:14'50 | A | Fast | 00:15'00 | dB | 63.7 | 72.3 | 66.4 | 57.6 |
| @CAL3280 | 09/08/11 | 21:29'50 | A | Fast | 00:15'00 | dB | 63.3 | 72.9 | 64.7 | 57.2 |
| @CAL3281 | 09/08/11 | 21:44'50 | A | Fast | 00:15'00 | dB | 65.4 | 77.9 | 65.4 | 55.7 |
| @CAL3282 | 09/08/11 | 21:59'50 | A | Fast | 00:15'00 | dB | 57.7 | 64.2 | 61.0 | 52.3 |
| @CAL3283 | 09/08/11 | 22:14'50 | A | Fast | 00:15'00 | dB | 55.3 | 64.0 | 57.7 | 50.0 |
| @CAL3284 | 09/08/11 | 22:29'50 | A | Fast | 00:15'00 | dB | 54.1 | 62.7 | 56.4 | 47.2 |
| @CAL3285 | 09/08/11 | 22:44'50 | A | Fast | 00:15'00 | dB | 52.2 | 58.9 | 55.0 | 46.4 |
| @CAL3286 | 09/08/11 | 22:59'50 | A | Fast | 00:15'00 | dB | 53.0 | 62.2 | 55.6 | 45.6 |
| @CAL3287 | 09/08/11 | 23:14'50 | A | Fast | 00:15'00 | dB | 53.4 | 61.7 | 55.1 | 45.7 |
| @CAL3288 | 09/08/11 | 23:29'50 | A | Fast | 00:15'00 | dB | 52.5 | 59.9 | 55.0 | 45.1 |
| @CAL3289 | 09/08/11 | 23:44'50 | A | Fast | 00:15'00 | dB | 50.9 | 58.5 | 54.1 | 44.4 |
| @CAL3290 | 09/08/11 | 23:59'50 | A | Fast | 00:15'00 | dB | 50.8 | 57.3 | 54.5 | 44.1 |
| @CAL3291 | 10/08/11 | 00:14'50 | A | Fast | 00:15'00 | dB | 52.0 | 60.9 | 54.8 | 44.4 |
| @CAL3292 | 10/08/11 | 00:29'50 | A | Fast | 00:15'00 | dB | 50.3 | 58.6 | 53.3 | 43.2 |
| @CAL3293 | 10/08/11 | 00:44'50 | A | Fast | 00:15'00 | dB | 49.8 | 57.1 | 53.1 | 43.0 |
| @CAL3294 | 10/08/11 | 00:59'50 | A | Fast | 00:15'00 | dB | 47.0 | 54.6 | 50.4 | 41.3 |
| @CAL3295 | 10/08/11 | 01:14'50 | A | Fast | 00:15'00 | dB | 48.8 | 56.3 | 51.2 | 41.4 |
| @CAL3296 | 10/08/11 | 01:29'50 | A | Fast | 00:15'00 | dB | 47.4 | 55.2 | 50.6 | 41.2 |
| @CAL3297 | 10/08/11 | 01:44'50 | A | Fast | 00:15'00 | dB | 47.2 | 54.9 | 51.0 | 41.0 |
| @CAL3298 | 10/08/11 | 01:59'50 | A | Fast | 00:15'00 | dB | 48.0 | 56.3 | 51.5 | 41.1 |
| @CAL3299 | 10/08/11 | 02:14'50 | A | Fast | 00:15'00 | dB | 47.5 | 55.5 | 51.1 | 40.6 |
| @CAL3300 | 10/08/11 | 02:29'50 | A | Fast | 00:15'00 | dB | 47.0 | 54.7 | 50.6 | 40.3 |
| @CAL3301 | 10/08/11 | 02:44'50 | A | Fast | 00:15'00 | dB | 54.5 | 63.4 | 56.2 | 40.8 |
| @CAL3302 | 10/08/11 | 02:59'50 | A | Fast | 00:15'00 | dB | 50.8 | 57.2 | 50.4 | 40.4 |
| @CAL3303 | 10/08/11 | 03:14'50 | A | Fast | 00:15'00 | dB | 47.3 | 54.6 | 51.3 | 41.0 |
| @CAL3304 | 10/08/11 | 03:29'50 | A | Fast | 00:15'00 | dB | 48.0 | 56.8 | 51.6 | 40.8 |
| @CAL3305 | 10/08/11 | 03:44'50 | A | Fast | 00:15'00 | dB | 47.7 | 55.0 | 51.4 | 40.7 |
| @CAL3306 | 10/08/11 | 03:59'50 | A | Fast | 00:15'00 | dB | 48.4 | 56.7 | 52.3 | 41.2 |
| @CAL3307 | 10/08/11 | 04:14'50 | A | Fast | 00:15'00 | dB | 50.5 | 59.3 | 54.0 | 41.3 |
| @CAL3308 | 10/08/11 | 04:29'50 | A | Fast | 00:15'00 | dB | 49.5 | 57.7 | 52.8 | 41.4 |
| @CAL3309 | 10/08/11 | 04:44'50 | A | Fast | 00:15'00 | dB | 50.2 | 58.2 | 53.8 | 41.7 |
| @CAL3310 | 10/08/11 | 04:59'50 | A | Fast | 00:15'00 | dB | 50.1 | 56.5 | 53.9 | 42.8 |
| @CAL3311 | 10/08/11 | 05:14'50 | A | Fast | 00:15'00 | dB | 50.2 | 56.8 | 54.2 | 43.1 |
| @CAL3312 | 10/08/11 | 05:29'50 | A | Fast | 00:15'00 | dB | 52.0 | 58.8 | 55.5 | 44.2 |
| @CAL3313 | 10/08/11 | 05:44'50 | A | Fast | 00:15'00 | dB | 53.9 | 61.6 | 57.2 | 45.9 |
| @CAL3314 | 10/08/11 | 05:59'50 | A | Fast | 00:15'00 | dB | 54.3 | 61.0 | 57.2 | 48.0 |
| @CAL3315 | 10/08/11 | 06:14'50 | A | Fast | 00:15'00 | dB | 54.0 | 61.3 | 57.4 | 47.4 |
| @CAL3316 | 10/08/11 | 06:29'50 | A | Fast | 00:15'00 | dB | 56.6 | 62.3 | 58.9 | 52.0 |
| @CAL3317 | 10/08/11 | 06:44'50 | A | Fast | 00:15'00 | dB | 55.9 | 61.0 | 58.8 | 50.0 |
| @CAL3318 | 10/08/11 | 06:59'50 | A | Fast | 00:15'00 | dB | 57.1 | 63.2 | 59.8 | 52.3 |
| @CAL3319 | 10/08/11 | 07:14'50 | A | Fast | 00:15'00 | dB | 59.7 | 66.6 | 61.7 | 54.6 |
| @CAL3320 | 10/08/11 | 07:29'50 | A | Fast | 00:15'00 | dB | 63.3 | 70.4 | 66.4 | 58.3 |
| @CAL3321 | 10/08/11 | 07:44'50 | A | Fast | 00:15'00 | dB | 66.6 | 74.6 | 68.3 | 62.4 |
| @CAL3322 | 10/08/11 | 07:59'50 | A | Fast | 00:15'00 | dB | 66.2 | 74.2 | 68.0 | 61.6 |
| @CAL3323 | 10/08/11 | 08:14'50 | A | Fast | 00:15'00 | dB | 68.0 | 73.8 | 69.8 | 64.3 |
| @CAL3324 | 10/08/11 | 08:29'50 | A | Fast | 00:15'00 | dB | 66.2 | 73.7 | 68.4 | 62.2 |
| @CAL3325 | 10/08/11 | 08:44'50 | A | Fast | 00:15'00 | dB | 68.2 | 75.5 | 70.5 | 63.5 |
| @CAL3326 | 10/08/11 | 08:59'50 | A | Fast | 00:15'00 | dB | 67.7 | 75.0 | 70.1 | 62.3 |
| @CAL3327 | 10/08/11 | 09:14'50 | A | Fast | 00:15'00 | dB | 67.4 | 74.9 | 70.0 | 62.8 |
| @CAL3328 | 10/08/11 | 09:29'50 | A | Fast | 00:15'00 | dB | 67.5 | 76.1 | 70.1 | 62.4 |

# Callisia Limited

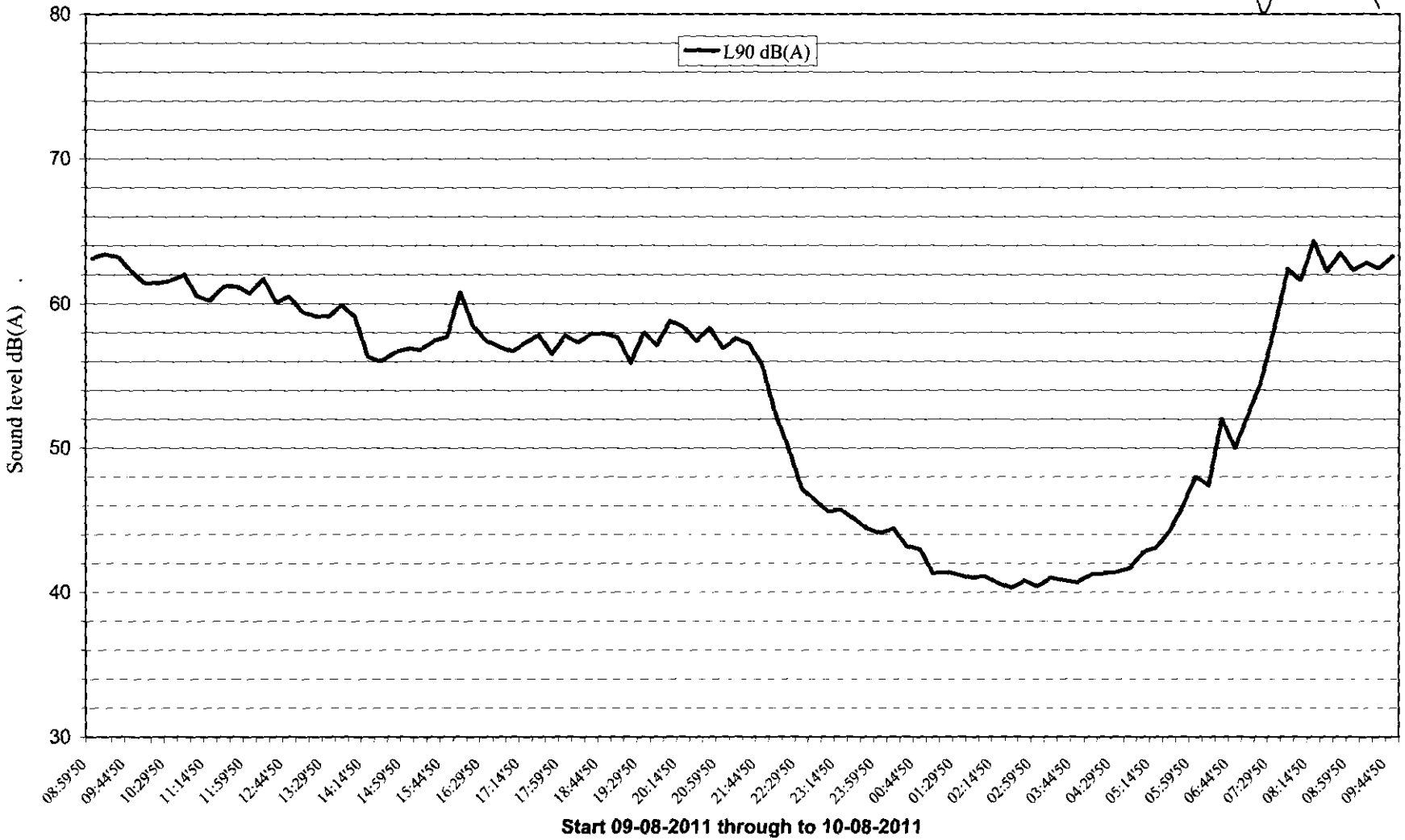
## 71 Kingsway, London.




**Start 09-08-2011 through to 10-08-2011**

# Callisia Limited

**71 Kingsway, London.**

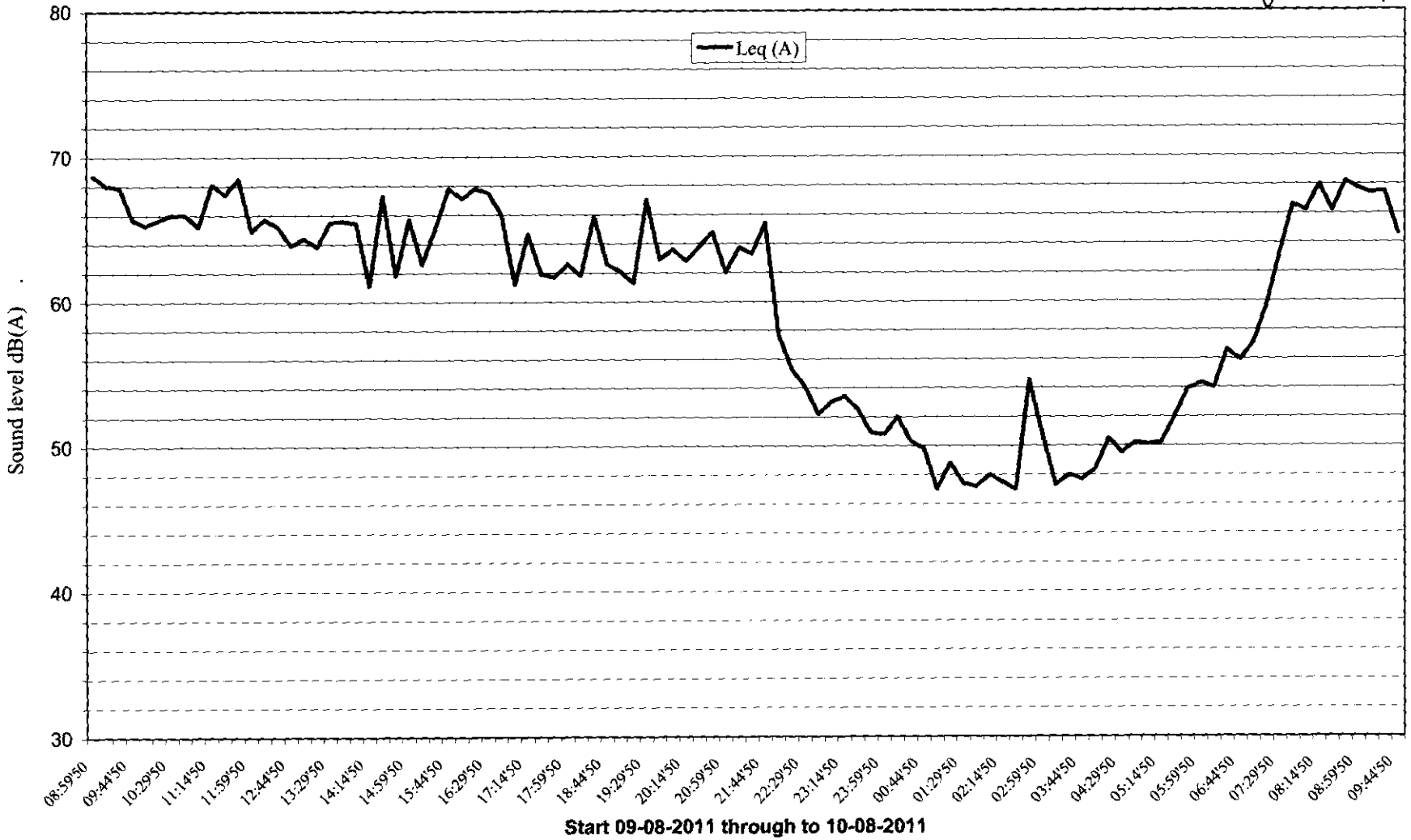



**Start 09-08-2011 through to 10-08-2011**

CS7076
15th August 2011

# Callisia Limited

## 71 Kingsway, London.




**Start 09-08-2011 through to 10-08-2011**

MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS



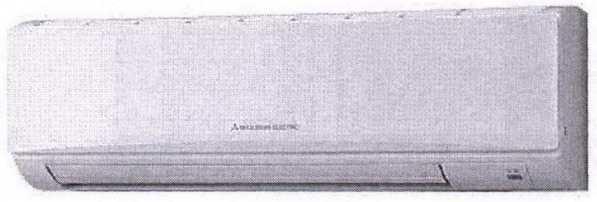
# PKA-RP100KAL

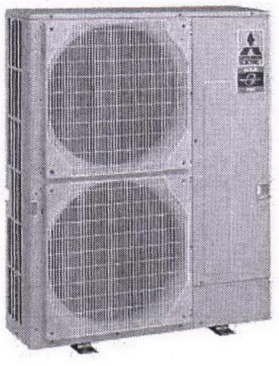
Power Inverter Heat Pump

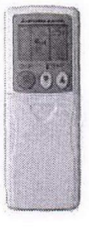
R410A Wall Mounted System

Advanced inverter technology makes the Mr Slim Power Inverter the number one choice for improving comfort. They provide energy savings of up to 70% annually when compared to a previous non-inverter model. Operating noise has also been reduced thanks to improvements in fan design, while existing pipe work is reusable for easier maintenance and installation.

- **New flat panel, compact indoor unit design**
- **Adjustable louvres for uniform air distribution**
- **Internal pipe connection to wall mounted unit for easy and neat installation**







Pictures not to scale

## Product Details

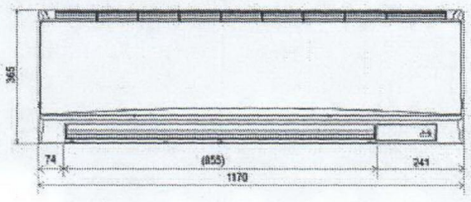
| PKA-RP100KAL Indoor Unit | |
|---|---|
| Capacity (kW): | |
| Heating (Nominal) (Low - High) | 11.20 (4.50 - 14.00) |
| Cooling (Nominal) (Low - High) | 10.00 (4.90 - 11.40) |
| Heating (UK) (Low - High) | 9.50 (3.85 - 11.90) |
| Cooling (UK) (Low - High) | 9.20 (4.50 - 10.50) |
| SHF R410A (Nominal) | 0.73 |
| COP / EER (Nominal) | 3.61 / 3.45 |
| Energy Label Heating / Cooling | A / A |
| Width - mm | 1170 |
| Depth - mm | 295 |
| Height - mm | 365 |
| Weight - kg | 21 |
| Airflow (m3/min) - Lo-Mi-Hi | 20-23-26 |
| Noise (dBA) - Lo-Mi-Hi | 41-45-49 |
| Pipe Size Gas mm (in) | 15.88 (5/8) |
| Pipe Size Liquid mm (in) | 9.52 (3/8) |
| Electrical Supply | Fed by Outdoor Unit |
| Phase | Single |
| Fuse Rating (BS88) - HRC (A) | 6 |
| Interconnecting Cable No. Cores | 4 |

| PUHZ-RP100VKA Outdoor Unit | |
|---|---|
| Width - mm | 1050 |
| Depth - mm | 330+30 |
| Height - mm | 1338 |
| Weight - kg | 116 |
| Noise (dBA) (Heating /Cooling) - Lo-Hi | 51 /46-49 |
| Electrical Supply | 220-240v, 50Hz |
| Phase | Single |
| Fuse Rating (BS88) - HRC (A) | 32 |
| SystemPower Input (kW) - Heating (Nominal) | 3.1 |
| SystemPower Input (kW) - Cooling (Nominal) | 2.9 |
| SystemPower Input (kW) - Heating (UK) | 2.76 |
| SystemPower Input (kW) - Cooling (UK) | 2.47 |
| Starting Current (A) | 5 |
| SystemRunning Current (A) - Heating / Cooling | 14.15 / 13.25 |
| Mains Cable No. Cores | 3 |
| Max Pipe Length (m) | 75 |
| Max Height Difference (m) | 30 |
| Charge (kg) - 30m | 5 |

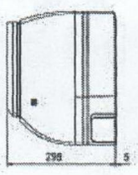
## Dimensions

PKA-RP100KAL

Front View >

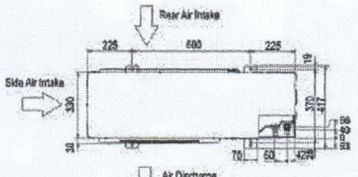



Side View >

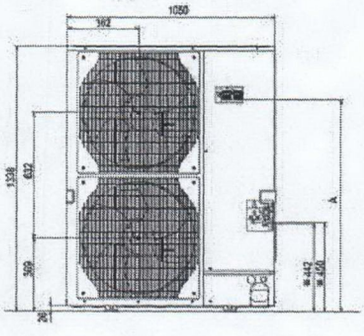



PUHZ-RP100VKA

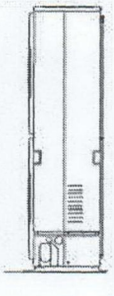
Upper View >




Front View >




Right Side View >



MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS

**Telephone: 01707 282880**
Email: air.conditioning@meuk.mee.com Website: http://www.mitsubishielectric.co.uk/aircon



**Tel:**
**Fax:**

MITSUBISHI ELECTRIC
AIR CONDITIONING SYSTEMS



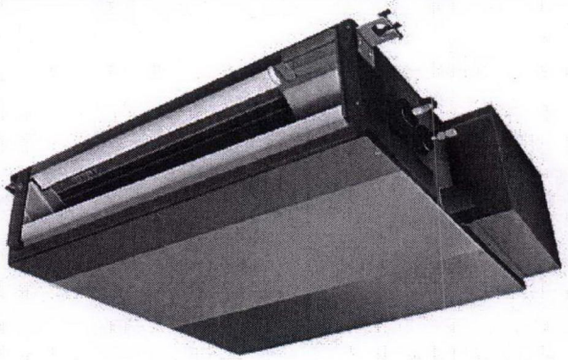
R410

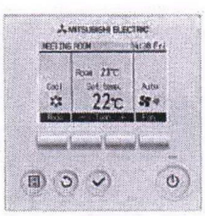
# SEZ-KD50VAQ

Inverter Heat Pump

R410A Ceiling Concealed Ducted System

Designed for homes, offices, restaurants or shops, the SEZ series operates at low noise levels and is virtually invisible when installed within a suspended ceiling. Its low unit height and lightweight design also helps to make installation easier and more convenient.






Pictures not to scale

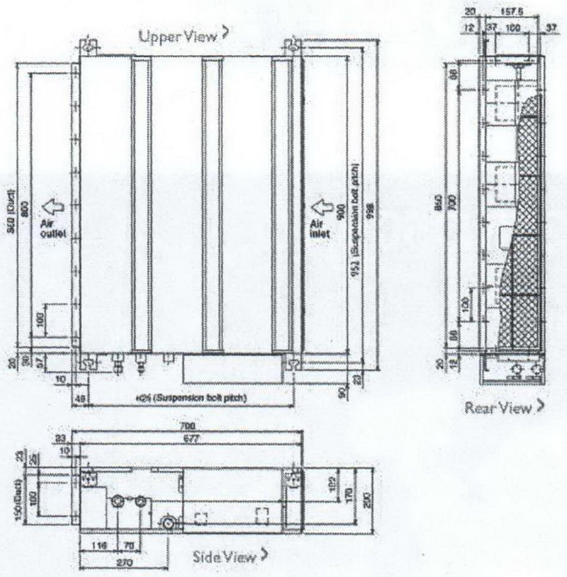
## Product Details

| SEZ-KD50VAQ Indoor Unit | |
|---|---|
| Capacity (kW): | |
| Heating (Nominal) (Low - High) | 6.40 (1.10 - 7.20) |
| Cooling (Nominal) (Low - High) | 5.10 (1.10 - 5.60) |
| Heating (UK) (Low - High) | 5.30 (0.90 - 6.00) |
| Cooling (UK) (Low - High) | 5.05 (1.10 - 5.55) |
| SHF R410A (Nominal) | 0.76 |
| COP / EER (Nominal) | 3.54 / 3.11 |
| Energy Label Heating / Cooling | B / B |
| Width - mm | 990 |
| Depth - mm | 700 |
| Height - mm | 200 |
| Weight - kg | 23 |
| Airflow (m3/min) - Lo-Mi-Hi | 10-12.5-15 |
| External Static Pressure Pa - Lo-Mid-Hi | 5-15-50 |
| Noise (dBA) - Lo-Mi-Hi | 30-34-37 |
| Pipe Size Gas mm (in) | 12.7 (1/2) |
| Pipe Size Liquid mm (in) | 6.35 (1/4) |
| Electrical Supply | Fed by Outdoor unit |
| Phase | Single |
| Fuse Rating (BS88) - HRC (A) | 6 |
| Interconnecting Cable No. Cores | 4 |

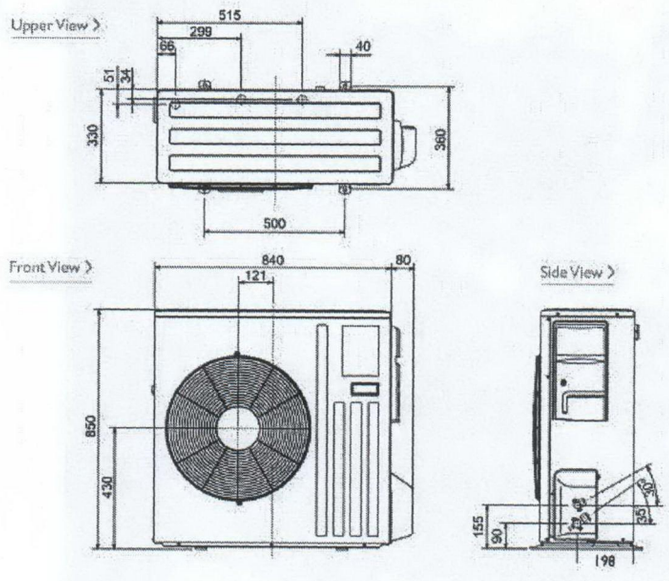
| SUZ-KA50VA2 Outdoor Unit | |
|---|---|
| Width - mm | 840 |
| Depth - mm | 330 |
| Height - mm | 850 |
| Weight - kg | 53 |
| Noise (dBA) (Heating /Cooling) | 55 /53 |
| Electrical Supply | 220-240v, 50Hz |
| Phase | Single |
| Fuse Rating (BS88) - HRC (A) | 20 |
| SystemPower Input (kW) - Heating (Nominal) | 1.81 |
| SystemPower Input (kW) - Cooling (Nominal) | 1.64 |
| SystemPower Input (kW) - Heating (UK) | 1.65 |
| SystemPower Input (kW) - Cooling (UK) | 1.31 |
| Starting Current (A) | 16.7 |
| SystemRunning Current (A) - Heating / Cooling | 7.05 / 7.45 |
| Mains Cable No. Cores | 3 |
| Max Pipe Length (m) | 30 |
| Max Height Difference (m) | 30 |
| Charge (kg) - 7m | 1.6 |

## Dimensions

SEZ-KD50VAQ




SUZ-KA50VA2




MITSUBISHI ELECTRIC
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Email: air.conditioning@meuk.mee.com Website: http://www.mitsubishielectric.co.uk/aircon



**Tel:**
**Fax:**

All dimensions must be checked on site & not scaled from this drawing.

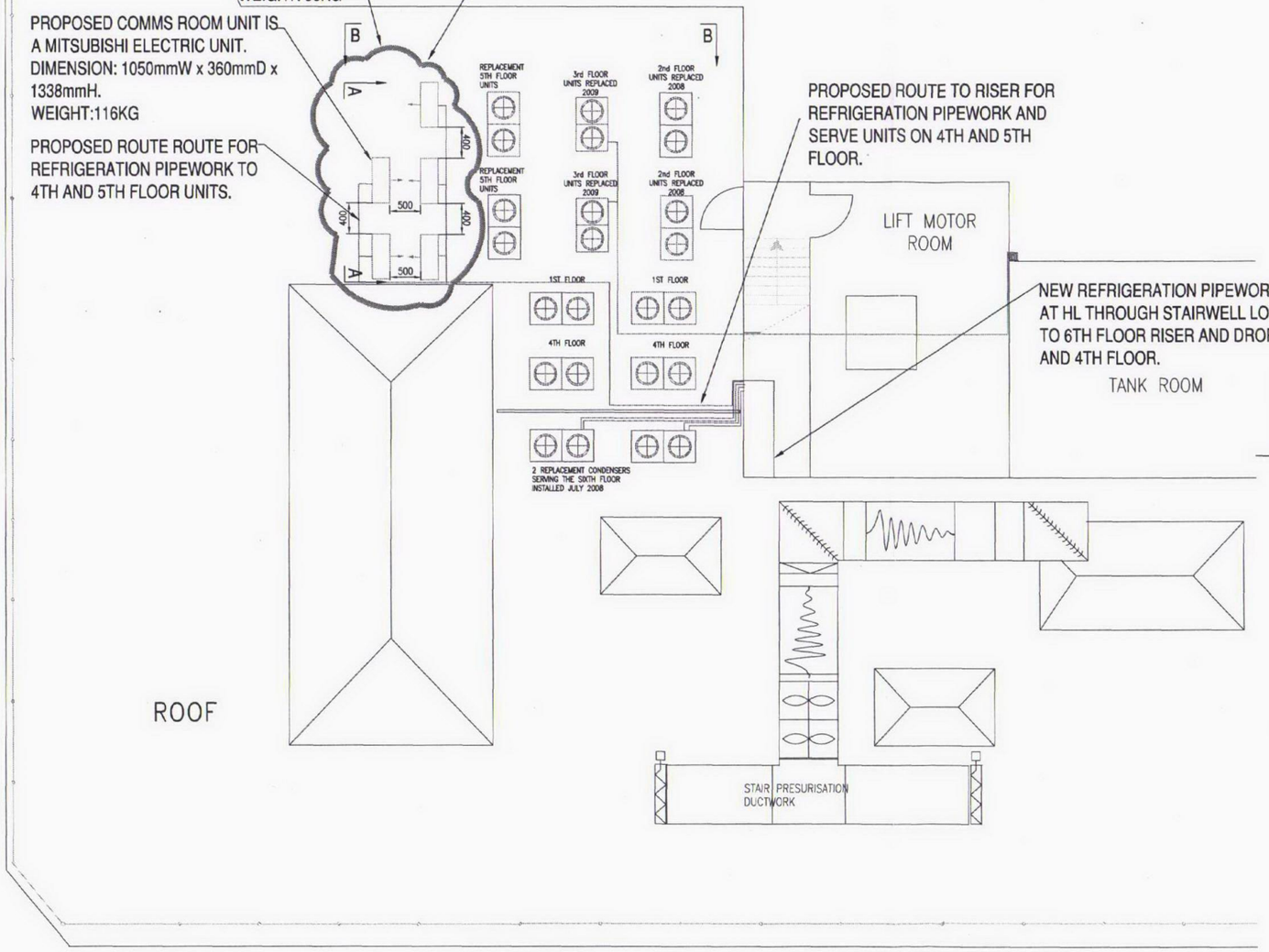
PROPOSED LOCATION FOR NEW SPLIT AC UNIT CONDENSERS SERVING 4TH AND 5TH FLOOR. DIMENSION APPROX: 840wx330dx880h. WEIGHT: 55KG

CONDENSERS TO BE MOUNTED ON BIGFOOT FRAME.

PROPOSED COMMS ROOM UNIT IS A MITSUBISHI ELECTRIC UNIT. DIMENSION: 1050mmW x 360mmD x 1338mmH. WEIGHT:116KG

PROPOSED ROUTE ROUTE FOR REFRIGERATION PIPEWORK TO 4TH AND 5TH FLOOR UNITS.

PROPOSED ROUTE TO RISER FOR REFRIGERATION PIPEWORK AND SERVE UNITS ON 4TH AND 5TH FLOOR.



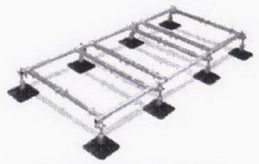

NEW REFRIGERATION PIPEWORK TO RUN AT HL THROUGH STAIRWELL LOBBY AREA TO 6TH FLOOR RISER AND DROP TO 5TH AND 4TH FLOOR.

PROPOSED ROOF LAYOUT 1:50

LEGEND

GREEN= NEW CONDENSERS

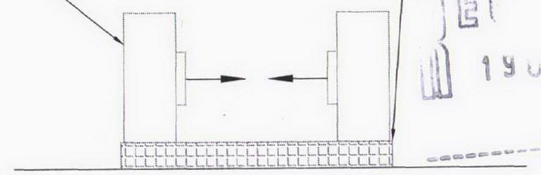
PINK= EXISTING CONDENSERS



PICTURE OF BIGFOOT

PROPOSED LOCATION FOR NEW SPLIT AC UNIT CONDENSERS SERVING 4TH AND 5TH FLOOR. DIMENSION APPROX: 840wx330dx880h. WEIGHT: 55KG

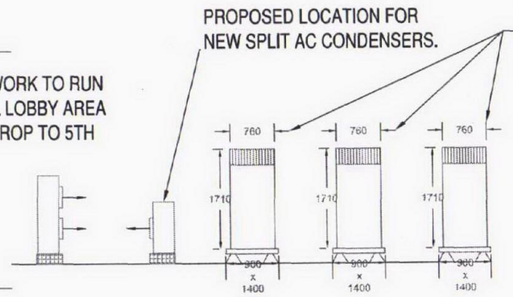
CONDENSERS TO BE MOUNTED ON BIGFOOT FRAME. MINIMUM HEIGHT OF BIGFOOT FRAME IS 215mm HIGH.



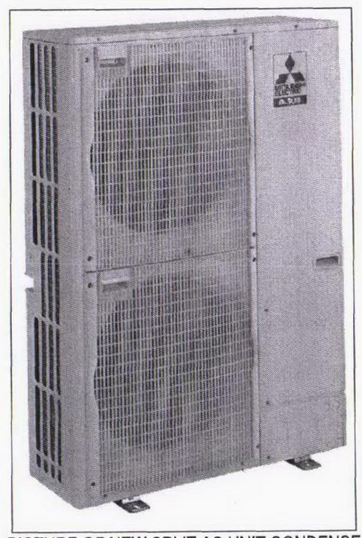
PROPOSED ELEVATION OF NEW CONDENSERS SECTION"A"-"A" SCALE 1:20

PROPOSED LOCATION FOR NEW SPLIT AC CONDENSERS.

EXISTING CONDENSERS SERVING WHOLE BUILDING MOUNTED ON BIGFOOT FRAME.




PROPOSED ELEVATION OF NEW & EXISTING CONDENSERS SECTION"B"-"B" SCALE 1:50



PICTURE OF NEW SPLIT AC UNIT CONDENSERS SERVING 4TH AND 5TH FLOOR. DIMENSION APPROX:840wx330dx880h. WEIGHT: 55KG

| Rev. | Description. | Date. |
|---|---|---|
| E | ELEVATION OF NEW AND EXISTING CONDENSERS ADDED. | 26.09.11 |
| D | PICTURE OF BIGFOOT ADDED AND DIMENSION ADDED. | 02.09.11 |
| C | PICTURE OF CONDENSER ADDED. | 18.08.11 |
| B | CONTRACT NUMBER ADDED PROPOSED REFRIGERATION ROUTE ADDED. | 16.08.11 |
| A | ELEVATION ADDED TO LAYOUT FOR PLANNING PURPOSES. | 02.08.11 |

Callisia


Callisia Limited
443 Stroude Road,
Virginia Water,
Surrey,
GU25 4BU
T: 01344 845 000
F: 01344 845 757
E: info@callisia.co.uk
W: www.callisia.co.uk


Job Title.

71 KINGSWAY
LONDON

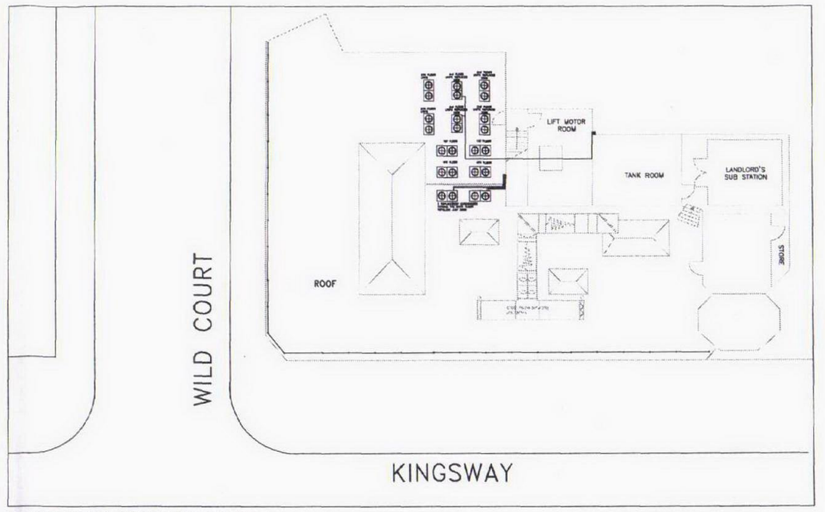
Drawing Title.

ROOF LAYOUT

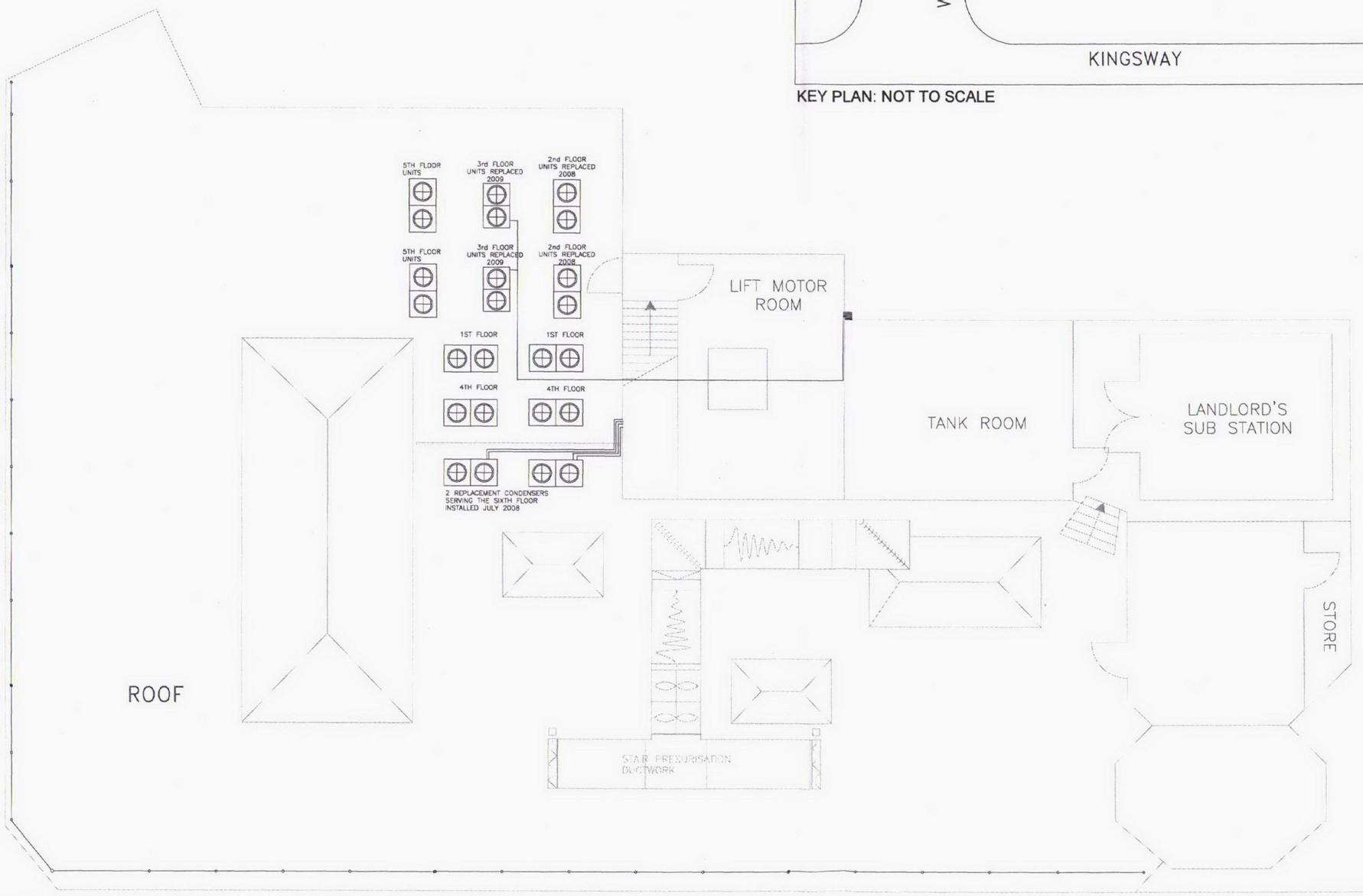
PROPOSED MECHANICAL LAYOUT

| Scale.@A1 | Date. |
|---|---|
| 1:50 | SEPT 2011 |
| Drawn. ZT | Checked |

| Drawing Number. | Rev. |
|---|---|
| 2611/M/03 | E |




KEY PLAN: NOT TO SCALE




EXISTING PLAN SCALE: 1:50





FOR PLANNING

| NO. | DATE | REVISIONS | AMEND |
|---|---|---|---|

APPROVED BY: DATE:

CLIENT:
MITSUBISHI

SITE ADDRESS:
71 KINGSWAY
LONDON WC2B 6

DRAWING NAME:
EXISTING ROOF PLAN

| DRAWN: | ASD | SCALE: | 1:50@A1 |
|---|---|---|---|
| CHECKED: | | DATE: | |

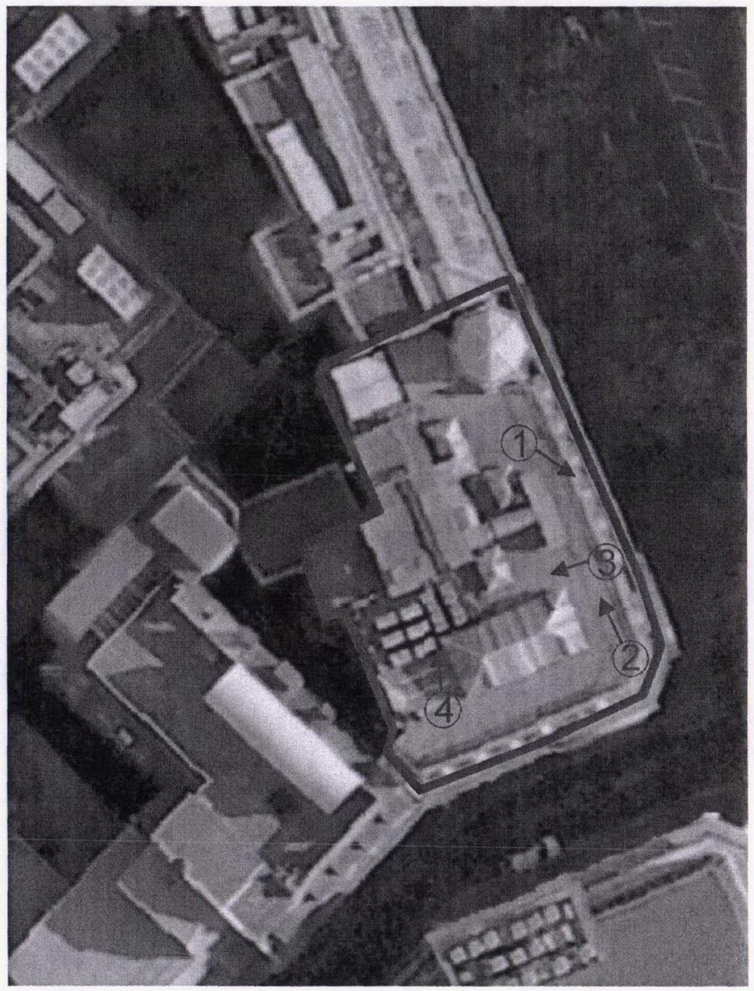
THE INTERIORS GROUP
Building on your design

20 Balderton Street
London
W1K 6TL

Tel: +44 (0)20 7495 1885
Email: info@interiorsgroup.co.uk

DRAWING REF. 5224_EXISTING _

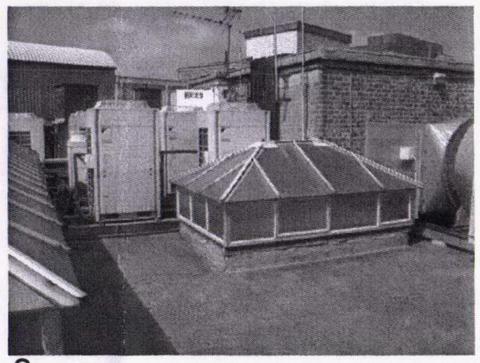
THE INTERIORS GROUP
Building on your design





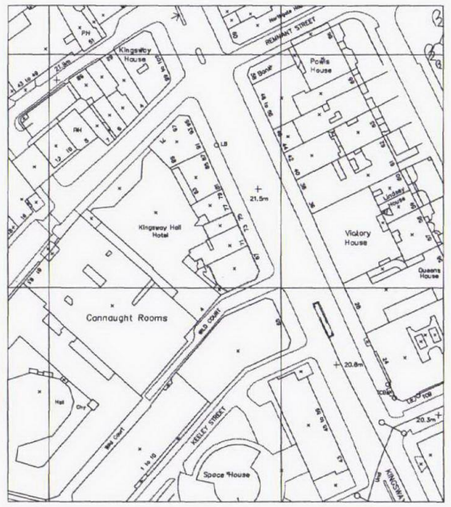
1


2

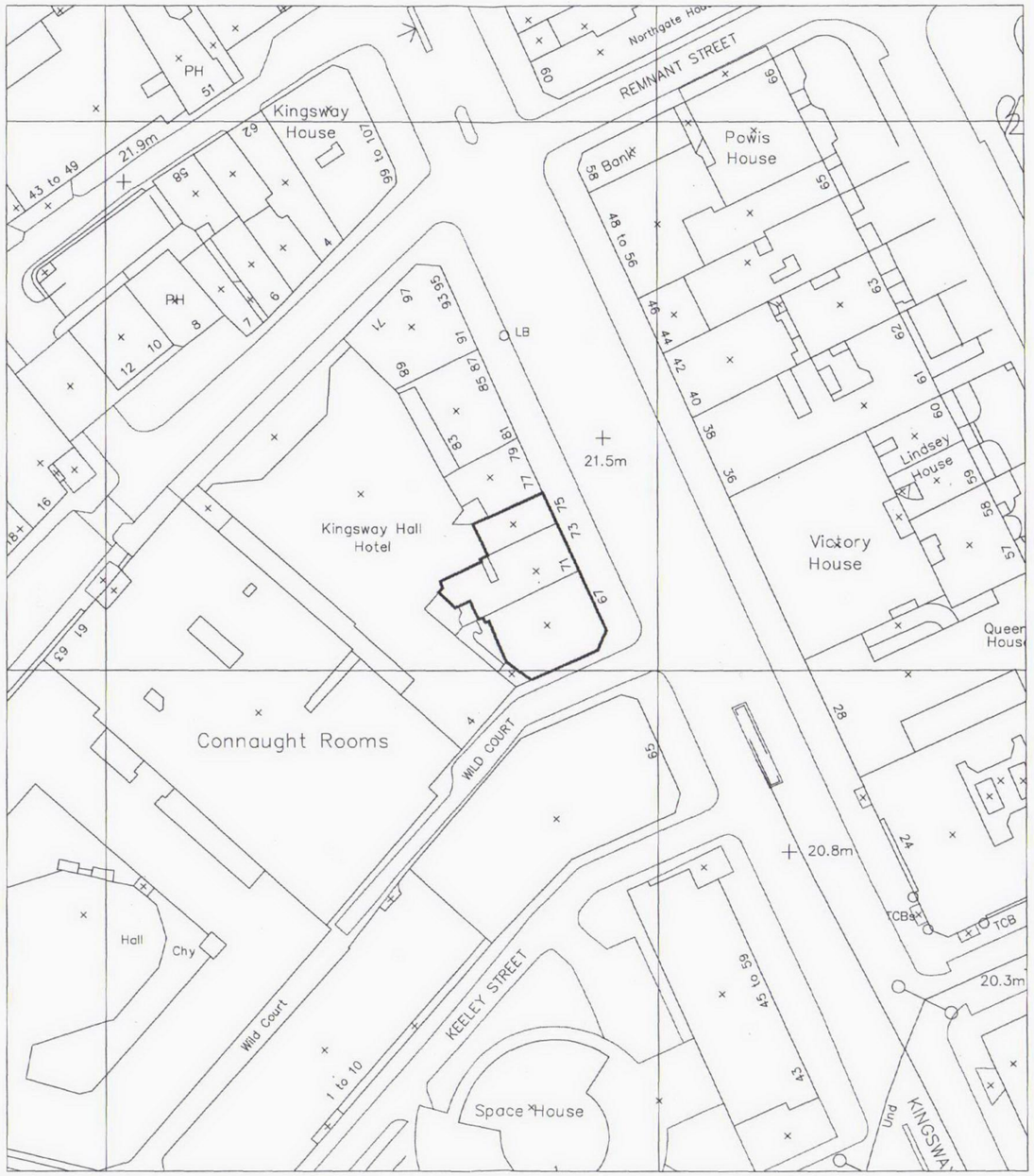

3


4

**71 KINGSWAY: EXISTING ROOF**




SCALE 1:1250




SCALE 1:500



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LONDON WC2B 6

DRAWING NAME:
ORDENANCE SURVEY

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| CHECKED: | | DATE: | 03.08.11 |

FOR PLANNING

THE INTERIORS GROUP
Building on your design

20 Balderton Street
London
W1K 6TL

Tel: +44 (0)20 7495 1885
Email: info@interiorsgroup.co.uk

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