RSK Acoustics

10 Regent's Park Road

# Plant Noise Assessment

Report 206/0306/P1

10 Regent's Park Road

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Report 206/0306/P1

Regents Park Housing Society Limited

10 Regents Park Road
London
NW1 7TY

| Revision | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 0 | 1st Issue | 30 June 2021 | Kantas Kaukenas | Andy Emery |



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# 1 Introduction

1.1 It is proposed to install new shared kitchen extract ventilation plant at 10 Regent's Park Road, London, to replace an existing fan serving the same purpose.

1.2 RSK Acoustics Ltd. have been instructed to undertake a noise survey at the site to quantify the existing noise climate, and an assessment of atmospheric plant noise emissions.

1.3 This report sets out the methodology and results of the noise survey and subsequent assessment work. Acoustic performance requirements are provided for noise mitigation measures as necessary.

# 2 Site Description

2.1 The site, located at 10 Regent's Park Road, London, is occupied by a several residential apartments.

2.2 The surrounding area is made up of residential streets. Directly to the rear (north) of the building are residences facing onto St Mark's Crescent and Gloucester Avenue, to the south east and west are further residences on Regent's Park Road.

2.3 The site and surrounding area are shown on attached site plan 206/0306/SP1.

# 3 Background Noise Survey

## 3.1 Methodology

3.1.1 An unattended noise survey was undertaken at the site commencing at 13h30 on Tuesday 22th June and ending at 10h30 on Thursday 24th June 2021.

3.1.2 Noise measurements were taken from one position on the site, representative of the closest residences to the proposed new plant installation. The measurement position is described below, and is illustrated in attached site plan 206/0306/SP1:

- MP1 In the western corner of site near the boundaries shared with 12 Regent's Road. The microphone was positioned at a height of 1.5m above roof level;

3.1.3 This position was selected to quantify background noise levels representative of those at the nearest noise sensitive receptors to the proposed mechanical services plant.

3.1.4 Measurements of the $L_{Aeq}$, $L_{Amax}$ and $L_{A90}$ indices were recorded over consecutive 15 minute periods for the duration of the survey using the equipment listed within Table T1 below (see attached Glossary of Acoustic Terms for an explanation of the noise units used).

| Item | Manufacturer | Type |
|---|---|---|
| Sound Level Analyser (x1) | Rion | NL-52 |
| Acoustic Calibrator (x1) | Rion | NC-74 |
| Weatherproof windshield (x1) | Rion | WS-15 |

T1 Equipment used during unattended noise survey.

3.1.5 The microphone was fitted within weatherproof enclosures, and the sound level meter was calibrated before and after the survey in order to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.

3.1.6 The weather conditions when setting up and collecting the noise monitoring equipment were cloudy, mild and dry with slight breeze. The weather stayed the same throughout the survey period.

### 3.2 Results

3.2.1 The results of the noise measurements at MP1 are presented in attached time history figure 206/0306/TH1.

3.2.2 The noise climate onsite throughout the daytime and nightime was predominantly affected by traffic on surrounding roads, with some contribution during the daytime from the existing shared kitchen extract fan which is to be replaced.

3.2.3 The representative background noise levels recorded during the day and night time measurement hours during the survey duration are set out in Table T2 below:

| Location | Representative Background Noise Level, dB(A) | |
|---|---|---|
| | Daytime (07h00-23h00) | Night Time (23h00-07h00) |
| MP1 – Roof of property | 48 | 36 |

T2 Representative background noise levels, $L_{A90}$.

## 4 Plant Noise Limits

4.1 The site falls within the jurisdiction of the London Borough of Camden. Appendix 3 of the Camden Local Plan 2017 provides the following guidance on noise limits for industrial and commercial noise sources:

*"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15 dB if tonal components are present) should be considered as the design criterion)."*

4.2 As seen in table T2 above the representative background noise levels during the night time period are 36dB $L_{A90,T}$. Following the Local Plan guidance for normally operating plant would define a noise limit of 26dB $L_{Ar,Tr}$ during the night time period. BS 4142:2014 provides the following relevant guidance with regards to low noise levels:

*"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

4.3 BS4142:1997 stated background sound levels below 30dBA and rating levels below 35dBA are considered 'very low'. For this reason, it is proposed that a rating level of 30dBA be taken as a lower limit for design criterion.

4.4 Therefore, in line with the above the noise limits for normally operating plant are to be set at 10dBA below the existing background noise level or 15dBA if the plant shows tonal characteristics, assessed in line with BS4142:2014, subject to a lower threshold of 30dBA.

4.5 The noise limit will be set to 10dB below the background noise level when plant is operating normally

4.6 Based on the above, the following plant noise limits are to apply here:

| **Location** | **Noise Emission Limit, dB $L_{Ar,Tr}$** | |
|---|---|---|
| | **Daytime (07h00-23h00)** | **Night Time (23h00-07h00)** |
| Nearest Residential Receivers (8 Regent's Park Rd) | 38 | 30 |

T3 Plant noise emission limits at the nearest residential properties.

4.7 The daytime and night time noise limits are to apply at 1m from the outside of nearby rooflight at 8 Regent's Park Rd. Any plant with a tonal component out of character with the existing environment would be subject to a further penalty.

# 5 Plant Noise Assessment

## 5.1 Assessment Details

5.1.1 The proposed external plant items are listed below. Our assessment has used manufacturer's noise data for each plant item as shown in the attached schedule 206/0306/SCH1. The locations of the external plant items and atmospheric duct terminations are marked indicatively on attached figure 206/0306/SP1.

- Fan-01 – kitchen extract; located on roof; atmospheric side ductwork terminates vertically in free space;

5.1.2 Plant items will be available for use at any time, therefore the night time noise limits set out in table T3 have been used.

5.1.3 Noise levels have been calculated to the noise sensitive receiver most exposed to the plant noise, indicated as AP1 on the attached site plan 206/0306/SP1 and described below:

- AP1 – 8 Regent's Park Road Rooflight;

5.1.4 The noise levels generated by the equipment at the assessment positions have been calculated by correcting the plant noise levels for internal duct losses, external radiation, distance and screening losses, façade reflections and any specified noise mitigation measures as applicable.

## 5.2 Requirered Mitigation Measures

5.2.1 The results of our assessment indicate it will be necessary to mitigate atmospheric noise emissions from Fan-01 using in-duct silencers.

5.2.2 The minimum insertion loss requirements for the silencer are indicated in the attached silencer schedule 206/0306/SCH2. We expect that the performance would be achieved using a 900mm length and 38% free area melinex lined splitter silencer.

5.2.3 In order to minimise regenerative noise, silencer should be sized to limit any pressure loss to no more than 40Pa. Any duct termination equipment must generate a pressure loss of no more than 25Pa.

5.2.4 The fan should be mounted on anti-vibration mounts and have flexible connections to rigid ductwork to minimise structure-born sound transmission.

5.2.5 We also recommend wrapping acoustic lagging around the short sections of ductwork from the fan up to and including the attenuators. Should no room-side attenuator be selected, the ductwork should be lagged up to the roof penetration. The lagging should comprise ≥25mm acoustic insulation inner layer with outer ≥5kg/m$^2$ mass barrier (e.g. available from TAP Acosutic http://www.muftilag.com/ or CMS Danskin https://www.cmsdanskin.co.uk/ )

### 5.3 Assessment Results

5.3.1 The rating noise levels calculated with the mitigation measures specified above are shown in table T4. It can be seen that the plant noise limits are met.

| Location | Calculated Plant Rating Noise Level, dB $L_{Ar,Tr}$ | Noise Emission Limit, dB $L_{Ar,Tr}$ |
|---|---|---|
| AP1 normally operating plant | 27 | 30 |

T4 Plant noise emission levels at the nearest noise sensitive properties.

5.3.2 Details of plant noise assessment calculations can be found in the attached sheets 206/0306/CS1 – 206/0306/CS3.

## 6 Conclusions

6.1 It is proposed to install new shared kitchen extract ventilation plant at 10 Regent's Park Road, London, to replace an existing fan serving the same purpose.

6.2 RSK Acoustic Ltd. have undertaken a survey at the site to quantify the existing noise levels. This report details the methodology and results of the survey.

6.3 Based on the results of the survey, suitable noise limits for the new mechanical services plant items have been defined taking account of guidance in the Camden Local Plan 2017.

6.4 An assessment of atmospheric noise emissions has been carried out, noise mitigation measures have been specified as necessary to enable the relevant noise limits to be met.

End of Section

# Glossary of Acoustic Terms

$L_{Aeq}$:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) $L_{eq}$.

$L_{Amax}$:

The maximum A-weighted sound pressure level recorded over the period stated. $L_{Amax}$ is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the $L_{Aeq}$ noise level. Unless described otherwise, $L_{Amax}$ is measured using the "fast" sound level meter response.

$L_{A10}$ & $L_{A90}$:

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The $L_{An}$ indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. $L_{A10}$ is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly $L_{A90}$ gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

$L_{A10}$ is commonly used to describe traffic noise. Values of dB $L_{An}$ are sometimes written using the alternative expression dB(A) $L_n$.

$L_{AX}$, $L_{AE}$ or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. $L_{AX}$ values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of $L_{Aeq}$ for the total noise. The $L_{AX}$ term can sometimes be referred to as Exposure Level ($L_{AE}$) or Single Event Level (SEL).

End of Section

Figure 206/0306/SP1

Title: Site Plan showing noise survey measurement position MP1 and noise assessment receiver position AP1




Project: 10 Regent's Park Rd, London

Date: June 2021

Scale: Not to scale

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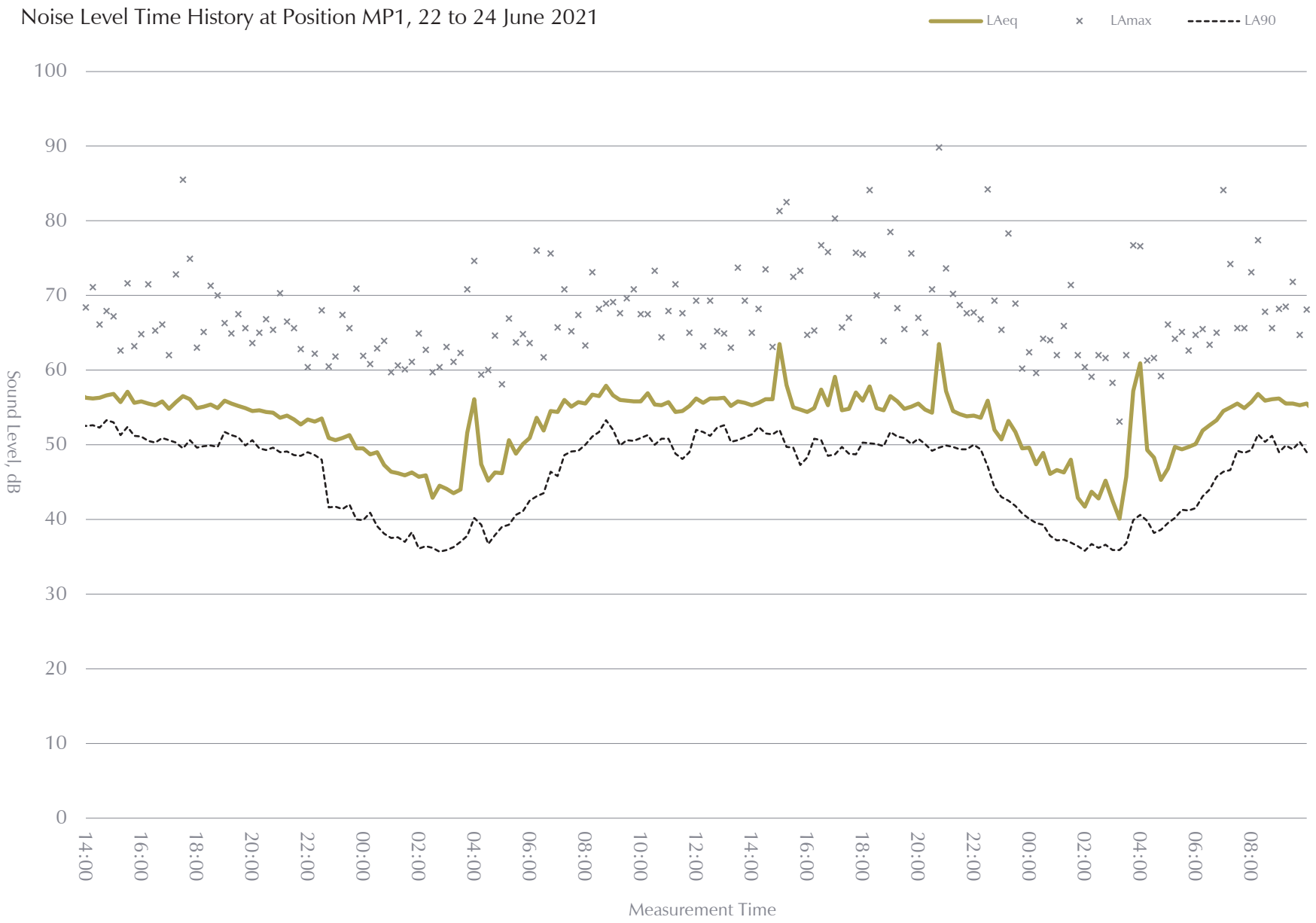



Figure 206/0306/TH01

Schedule of Plant and Air Handling Equipment Sound Levels, dB

| Reference | Unit Details | Data Source[1] | Noise Level Type | Noise Levels (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Exhaust | GigaBox GBW EC 355 | Man | Sound Power, Lw | - | 68.1 | 72.6 | 71.2 | 66.0 | 61.8 | 57.0 | 52.1 |
| Case Breakout | GigaBox GBW EC 355 | Man | Sound Power, Lw | - | 61.1 | 52.6 | 42.2 | 42.0 | 39.8 | 37.0 | 30.1 |

Notes

1 - Man refers to data supplied by the equipment manufacturer or supplier, Emp refers to data calculated using empirical formulae, and Meas refers to data measured by Cole Jarman

Schedule of silencers and required insertion loss, dB [1]

| Reference | Location | Silencer Type | Insertion Losses (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| ASO1 | Fan-01 atmos exhaust | 38% - 900 (Melinex) | 6 | 10 | 19 | 21 | 24 | 15 | 8 | 8 |

Notes

1 - To be read in conjunction with silencer specification

Calculation Sheet 206-0306-CS1

Exhaust to AP1

| | | Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **63** | **125** | **250** | **500** | **1k** | **2k** | **4k** | **8k** |
| ***Noise Source*** | | | | | | | | | |
| Noise Source - Exhaust | | | | | | | | | |
| **Sound Power Levels** | | **-** | **68.1** | **72.6** | **71.2** | **66.0** | **61.8** | **57.0** | **52.1** |
| ***Bend Loss CJ*** | | | | | | | | | |
| Dimension (mm) | 355.0 | | | | | | | | |
| No. of Bends (no.) | 1.0 | | | | | | | | |
| Type - Radiussed Bend - With Vanes | | | | | | | | | |
| Octave Band Read | | 0.0 | 0.0 | 0.0 | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 |
| | | *-* | *0.0* | *0.0* | *-1.0* | *-2.0* | *-3.0* | *-3.0* | *-3.0* |
| ***Silencer*** | | | | | | | | | |
| Silencer - ASO1 | | | | | | | | | |
| | | *-* | *-10.0* | *-19.0* | *-21.0* | *-24.0* | *-15.0* | *-8.0* | *-8.0* |
| ***Bend Loss CJ*** | | | | | | | | | |
| Dimension (mm) | 355.0 | | | | | | | | |
| No. of Bends (no.) | 1.0 | | | | | | | | |
| Type - Radiussed Bend - With Vanes | | | | | | | | | |
| Octave Band Read | | 0.0 | 0.0 | 0.0 | 1.0 | 2.0 | 3.0 | 3.0 | 3.0 |
| | | *-* | *0.0* | *0.0* | *-1.0* | *-2.0* | *-3.0* | *-3.0* | *-3.0* |
| ***End Reflection*** | | | | | | | | | |
| Width/Diameter (m) | 0.4 | | | | | | | | |
| Length (m) | - | | | | | | | | |
| Rec or Circ - Circular | | | | | | | | | |
| Free or Flush - Free Space | | | | | | | | | |
| | | *-* | *-9.2* | *-3.8* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* |

| | | Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| ***Point Source Radiation Loss*** | | | | | | | | | |
| Radiation - Hemispherical | | | | | | | | | |
| Single Figure Read | 8.0 | | | | | | | | |
| | | - | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* |
| ***External Grille Directivity*** | | | | | | | | | |
| Width (m) | 0.4 | | | | | | | | |
| Height (m) | 0.4 | | | | | | | | |
| Vertical (°) | 0.0 | | | | | | | | |
| Horizontal (°) | 130.0 | | | | | | | | |
| | | - | *-0.5* | *-1.5* | *-4.0* | *-8.5* | *-8.0* | *-8.0* | *-8.0* |
| ***Point Source Distance Loss*** | | | | | | | | | |
| Start Distance (m) | 1.0 | | | | | | | | |
| End Distance (m) | 6.0 | | | | | | | | |
| | | - | *-15.6* | *-15.6* | *-15.6* | *-15.6* | *-15.6* | *-15.6* | *-15.6* |
| ***Facade Reflection*** | | | | | | | | | |
| Reflection (dB) | 3.0 | | | | | | | | |
| | | - | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* |
| ***Maekawa Screening Loss*** | | | | | | | | | |
| Path Difference (m) | 0.0 | | | | | | | | |
| | | - | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.9* |
| ***External Receiver*** | | | | | | | | | |
| External Receiver - AP1 | | | | | | | | | |
| | | - | *14.4* | *6.8* | *2.8* | *14.2* | *9.1* | *5.2* | *3.9* |

| | | Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| ***dBA*** | | | | | | | | | |
| dBA | 27.1 | | | | | | | | |
| **Input** | | **-** | **37.5** | **29.9** | **21.7** | **18.4** | **16.6** | **14.8** | **8.5** |

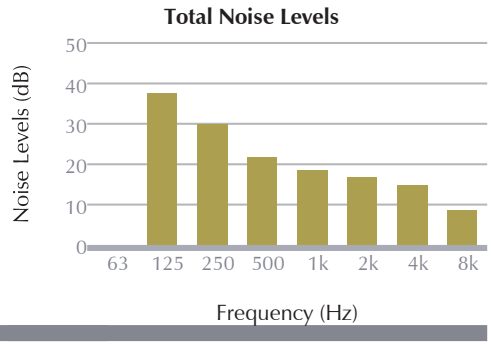
Calculation Sheet 206-0306-CS2

Case Breakout to AP1

| | | Octave Band Centre Frequency (Hz) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **63** | **125** | **250** | **500** | **1k** | **2k** | **4k** | **8k** |
| ***Noise Source*** | | | | | | | | | |
| Noise Source - Case Breakout | | | | | | | | | |
| **Sound Power Levels** | | **-** | **61.1** | **52.6** | **42.2** | **42.0** | **39.8** | **37.0** | **30.1** |
| ***Point Source Radiation Loss*** | | | | | | | | | |
| Radiation - Hemispherical | | | | | | | | | |
| Single Figure Read | 8.0 | | | | | | | | |
| | | *-* | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* | *-8.0* |
| ***Point Source Distance Loss*** | | | | | | | | | |
| Start Distance (m) | 1.0 | | | | | | | | |
| End Distance (m) | 5.0 | | | | | | | | |
| | | *-* | *-14.0* | *-14.0* | *-14.0* | *-14.0* | *-14.0* | *-14.0* | *-14.0* |
| ***Facade Reflection*** | | | | | | | | | |
| Reflection (dB) | 3.0 | | | | | | | | |
| | | *-* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* | *3.0* |
| ***Maekawa Screening Loss*** | | | | | | | | | |
| Path Difference (m) | 0.0 | | | | | | | | |
| | | *-* | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.8* | *-4.9* |
| ***External Receiver*** | | | | | | | | | |
| External Receiver - AP1 | | | | | | | | | |
| | | *-* | *0.2* | *1.0* | *3.2* | *0.2* | *0.6* | *1.6* | *2.3* |
| ***dBA*** | | | | | | | | | |
| dBA | 27.1 | | | | | | | | |
| **Input** | | **-** | **37.5** | **29.9** | **21.7** | **18.4** | **16.6** | **14.8** | **8.5** |

External Receiver Summary 206-0306CS3

| | |
|---|---|
| **Project Name** | 10 (8) Regent's Park Rd, |
| **Project Reference** | 206-0306 |
| **Receiver Reference** | AP1 |
| **Description** | 8 Regents Park Rd Roof light |
| **Noise Limit** | - |
| **dBA** | 27.1 |




| Reference | Noise Levels (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **63** | **125** | **250** | **500** | **1k** | **2k** | **4k** | **8k** |
| Case Breakout | - | 37.4 | 28.9 | 18.5 | 18.3 | 16.0 | 13.2 | 6.2 |
| Exhaust | - | 23.1 | 23.0 | 18.9 | 4.2 | 7.5 | 9.6 | 4.7 |

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